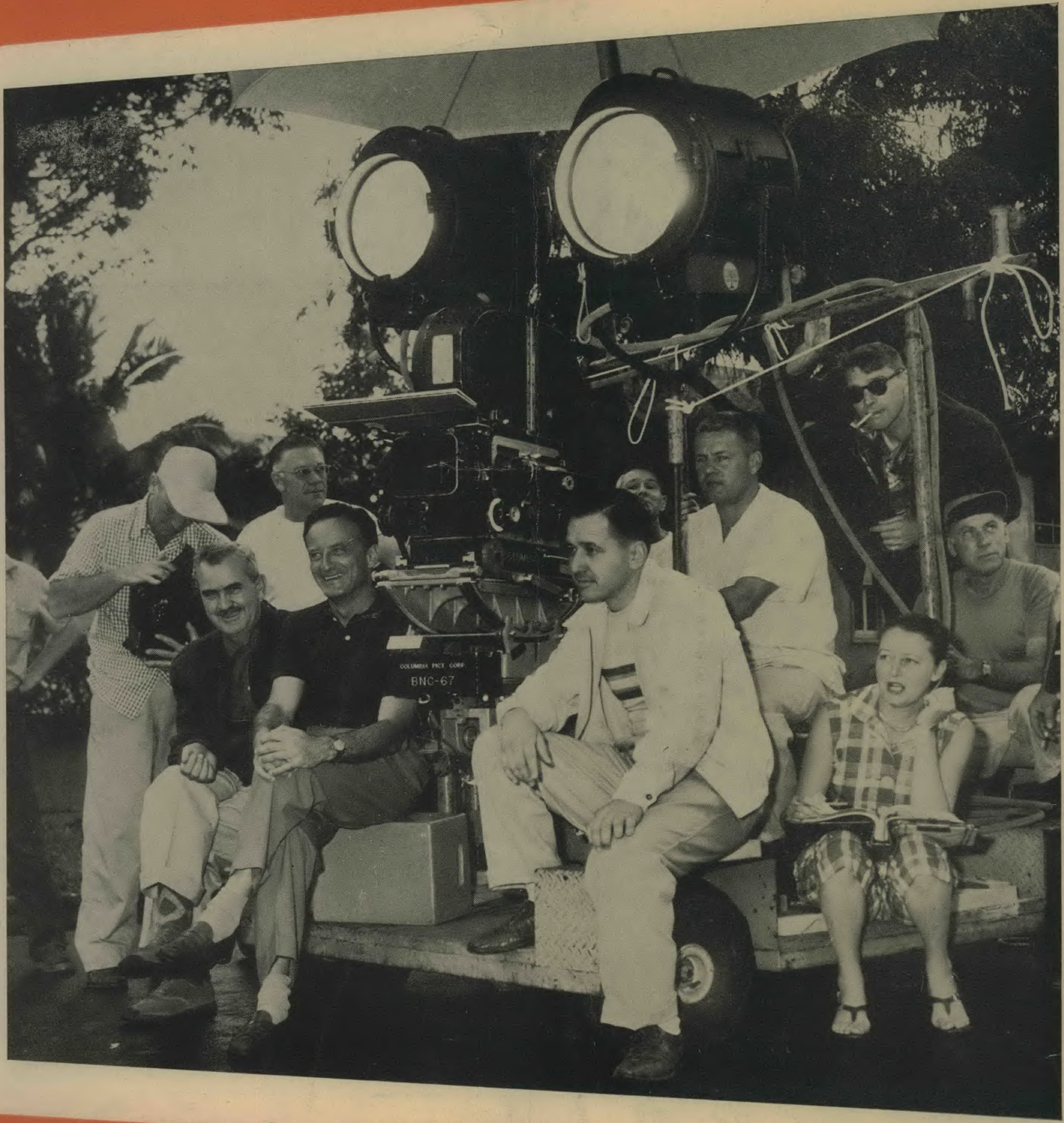
JUNE • 1953

AMERICAN Cinematographer

THE MAGAZINE OF MOTION PICTURE PHOTOGRAPHY

THEATRE
TELEVISION
INDUSTRIAL
AMATEUR



In This Issue . . .

HOW TO SHOOT 3-D MOVIES IN 16MM.

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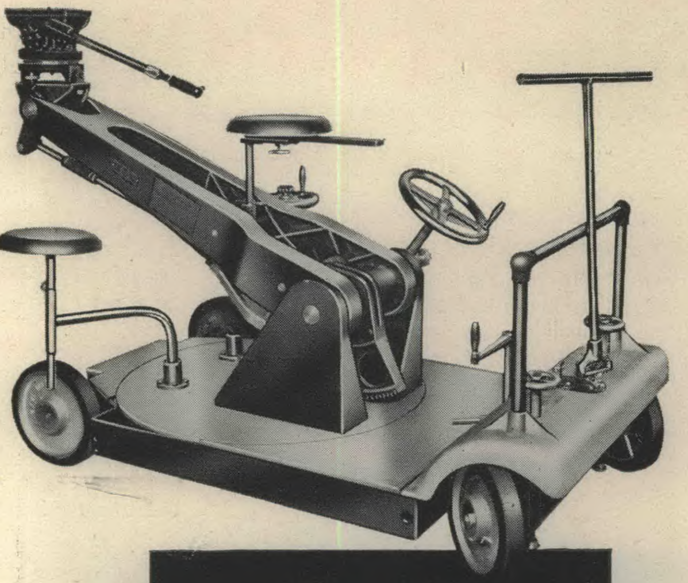
HOUSTON-FEARLESS PANORAM DOLLY... This versatile piece of equipment provides the cameraman with complete mobility and adjustment of camera angles. Leveling head, upon which friction or geared head is mounted, can be quickly, smoothly raised from 14" to 70" high, remaining level at all times. Entire cantilever arm revolves easily on turret base fast or slowly. Dolly rolls smoothly, quietly, turns on its own axis or can be moved sideways. Very maneuverable in tight places. Steel and aluminum construction provides maximum strength and minimum weight. Top quality throughout. Developed and improved during many years use by leading Hollywood Studios.



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"We've won two awards for our TV news coverage. To date, we've turned out almost a million feet of 16mm news film with Bell & Howell equipment. We know it can be depended on!"

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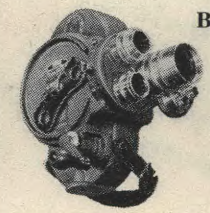

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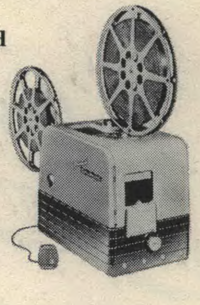
Ideal for news coverage. Rugged, versatile, dependable.

Filmosound
16mm optical and magnetic projectors for your final preview before releasing on the air.



Bell & Howell precision splicers, rewinds, viewers, editors and other laboratory equipment insure superior results.

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Cinematographer

THE MAGAZINE OF MOTION PICTURE PHOTOGRAPHY
PUBLICATION OF AMERICAN SOCIETY OF CINEMATOGRAPHERS

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* * *

ON THE COVER

HAPPY CREW—Director of photography Burnett Guffey, ASC, (left, sitting), director Fred Zinneman, assistant cameraman Bob Uhl, operator Kit Carson, script supervisor Charlsie Bryant and other crew members resting between takes on set of Columbia Pictures' "From Here To Eternity." The man with the sun glasses is star Burt Lancaster.—*Photo by Irving Lippman.*

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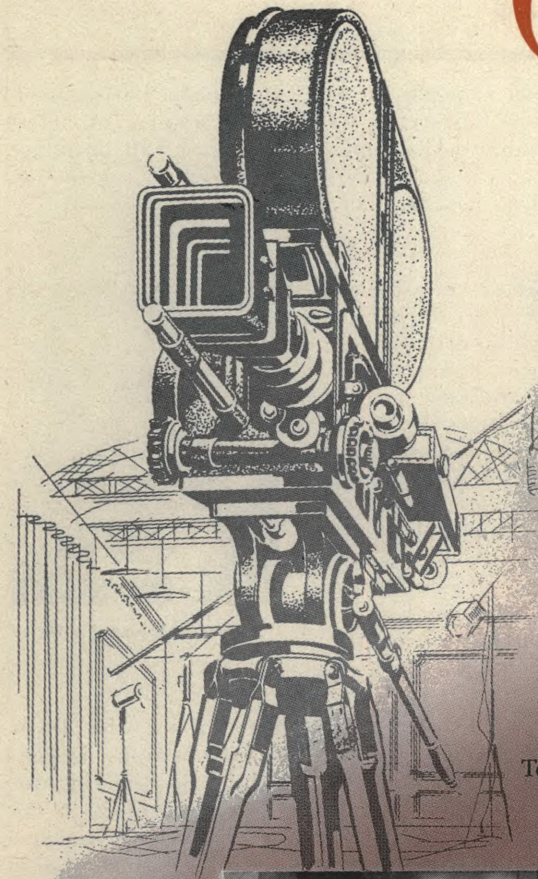

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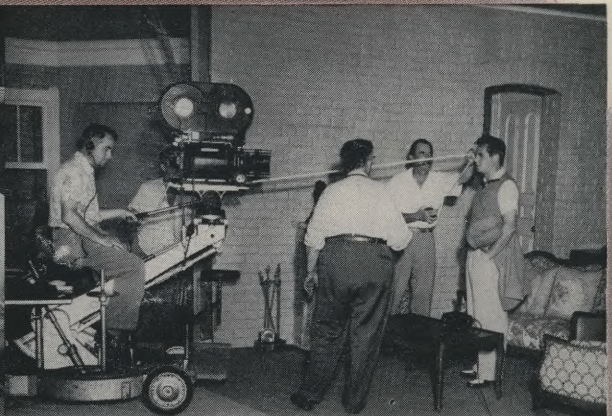
THE matchless technical perfection which a Mitchell camera brings to a film can insure the investment as can no other single element of production.

For over 25 years constant research and engineering by Mitchell has continued to produce, year after year, the most advanced and only truly professional motion picture camera. It is traditional of Mitchell cameras that in addition to filming the world's greatest films, they are to be found wherever new and exacting techniques of filming are being successfully used.

Mitchell cameras are today dependably serving such varied fields as Television, Business and Industry, Education, Government, the Armed Services, and major Motion Picture Studios.

the 1 and only *Mitchell*

Tom Kelley Studios shoots a TV commercial for North American Airlines with this Mitchell 35 "NC". Ceasar Romero is shown at center.



One of three Mitchell 35mm "BNC" Cameras used by Desilu Productions on the "I Love Lucy" series with Desi Arnaz, right, and Lucille Ball.

Mitchell cameras are *created*, not mass produced—the same supreme custom workmanship and smooth, positive operation is found in each Mitchell camera, 16 mm or 35 mm. Available to give Mitchell Cameras almost limitless capabilities, are the finest of professional accessories.

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85% of the motion pictures shown in theatres throughout the world are filmed with a Mitchell

Hollywood
Bulletin Board

R. A. SHERMAN of Bausch & Lomb Optical Co. (left) is introduced to members of the A.S.C. by Society vice-president Arthur Miller, preceding former's talk on 3-D at the A.S.C. clubhouse last month.

R. A. SHERMAN, Director of Occupational Vision, Bausch & Lomb Optical Co., was guest of honor at the ASC's May meeting when he discussed the effects of TV on human vision. "When properly made and projected, 3-D movies have beneficial effects on the eyes," Mr. Sherman told ASC members. Properly photographed 3-D films, he said, are those in which soft focus effects and out-of-focus photography is avoided. "These contribute to a disturbance of the relationship between focusing and visual convergence in members of the audience," Sherman said.

•

LEE GARMES, ASC, in association with actor John Ireland, has co-directed and photographed a western feature in color, using the twin-Camerette 3-D system of Stereo-Cine Corporation.

•

George S. Barnes, ASC

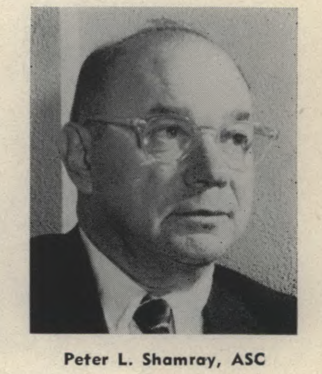
VETERAN director of photography George S. Barnes, ASC, died May 30th in Hollywood of complications following abdominal surgery.

A top cinematographer for the past 35 years, Barnes numbered the Academy Award-winning "Rebecca" among his numerous credits. Among the most recent was DeMille's "The Greatest Show On Earth," for the photography of which both he and Peverell Marley, ASC, were presented with the 1953 Golden Globe Award for best color photography.

Barnes directed the photography of top-budget films for majors and independents, his most recent associations being with Paramount and RKO-Radio studios. He was 60 years old at the time of his death. He is survived by his widow, Margaret, two sons, and two daughters.

A. COMA, export manager for Ets. Cine Eclair, Paris, manufacturers of the Camerette, was a Hollywood visitor last month. According to Mr. Coma, his company will introduce the Eclair 35mm Studio camera at the SMPTE convention in New York City next October.

•



Peter L. Shamray, ASC

PETER L. SHAMRAY, an associate member of the ASC, died May 12 in Los Angeles at the age of 59. He had been technical representative for DuPont's motion picture film division in Hollywood since 1927. Shamray's work in the motion picture field began in Hollywood in 1913. As a laboratory technician and later a superintendent, he was associated with D. W. Griffith, Fine Arts Film Co., Triangle-Keystone, and the Majestic company.

•

STANLEY CORTEZ, ASC, is one cinematographer who draws the line at no hazard where realistic photography is concerned. He recently photographed the John Rawlins-U-I production, "Shark River," in record time, most of it in the swamp country of Florida, with alligators a constant menace. Previously, he directed the photography in Eastman Color of Frank Melford's "The Diamond Queen," starring Fernando Lamas and Arlene Dahl.

•

PHIL TANNURA, ASC, has been signed to direct the photog-

(*Continued on Page 298*)

FOUR TECHNICAL EXPERTS get together for an informal chat at the A.S.C. clubhouse preceding the Society's monthly dinner-meeting in Hollywood last month. From left to right are: John Capstaff, Eastman Kodak Co.; Sidney Solow, Consolidated Film Industries; Tom Howard, Special Effects, MGM-London Studios; and Earl Sponable, research engineer, 20th Century-Fox studios.

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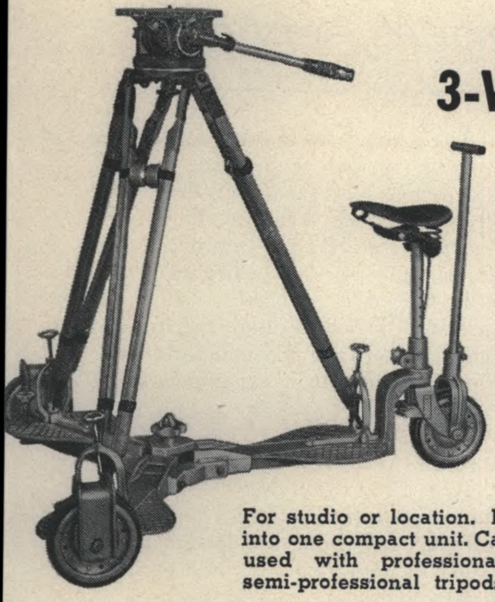


COLLAPSIBLE 3-WHEEL DOLLY

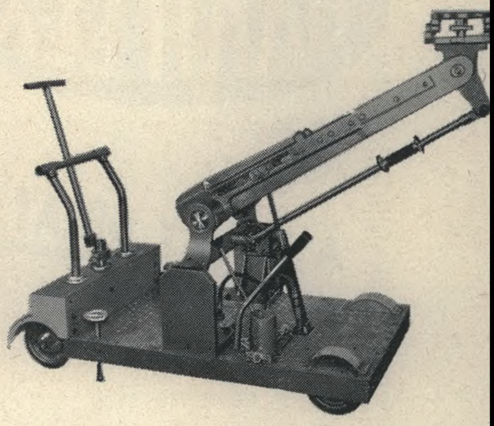
For motion picture and TV cameras. Sturdy cast aluminum. For standard or baby tripods. Additional baby tripod point holders to control spread of tripod legs. Adjustable spring seat. Extra wide rubber wheels. Bronze tie down clamps and other features.

For studio or location. Folds into one compact unit. Can be used with professional or semi-professional tripods.

'HYDROLLY'

TV OR CAMERA DOLLY

The advanced dolly for instant moveability — streamlined, lightweight, exceptionally sturdy. Nothing to get out of order. Many new advantages for easy operation. Hydraulic lift type for fast upward and downward motion of TV and motion picture cameras.



Swivel seat. Adjustable leveling head. Seat for assistant. In-line wheels for track use. Steering wheel, rigid floor locks. Hand pump or combination hand and motor pump. Easily transported in a station wagon. Fits through a 28" door.

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COMPLETE LINE OF: 16mm, 35mm cameras, dollies, synchronizers, animation stands, cutting room and time lapse equipment.

BELL & HOWELL: Standard, Eyemos, Filmos. MITCHELL: Standard, Hi-speed, BNC, NC, 16mm.

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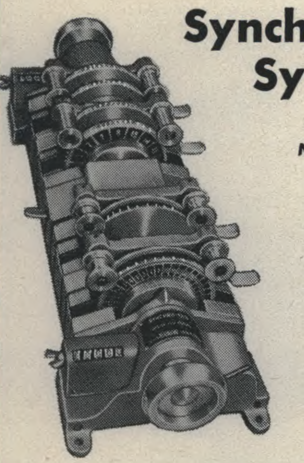

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Our Exclusive Distributor
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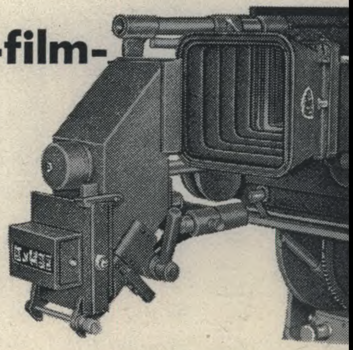
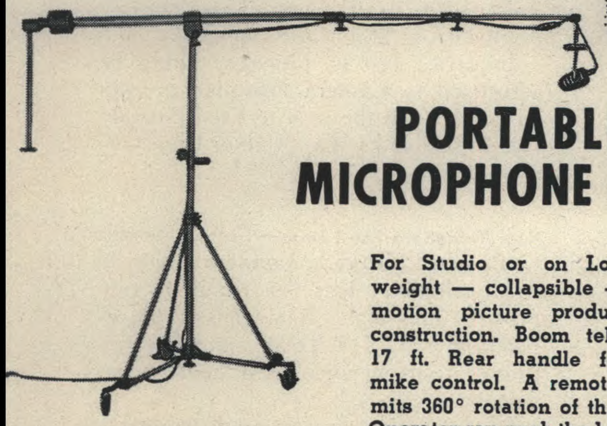
Any combination of 16mm and/or 35mm sprockets assembled to specification. Cast aluminum. Foot linear type, adjustable frame dial. Fast finger roller release. Contact rollers adjusted individually for positive film contact. Sprocket shaft slip lock, footage counter, etc.

Synchro-film-Slate



Pays for itself in production savings on the set. A New Development! Eliminates clap stick synch and slate on set. Mounts on double arm bracket to work with BNC, NC, Standard, 16mm Mitchell and all types of blimps and Geared Head. Interlocks with Sound Recorder.



PORTABLE MICROPHONE BOOM

For Studio or on Location. Lightweight — collapsible — for TV and motion picture production. Sturdy construction. Boom telescopes 7 to 17 ft. Rear handle for directional mike control. A remote control permits 360° rotation of the microphone. Operator can push the boom and operate microphone swivel simultaneously. Extension rods make it simple to operate microphone rotation from floor. Microphone cable hangs outside of boom, preventing cable from tangling with the rotation mechanism. Ball bearing casters, rigid foot locks, pneumatic drop check for lowering the boom, etc.

VARIABLE-SPEED MOTOR with TACHOMETER

for Cine Special or Maurer Cameras

115 V. Universal Motor — AC-DC
Separate Base for Cine Special.
Variable Speed 8-64 frames.
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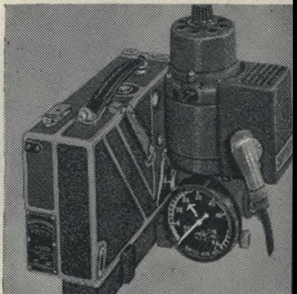
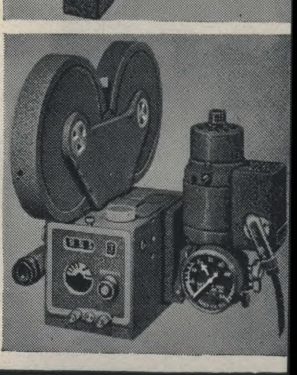
ANIMATION MOTORS: Cine Special, Maurer, Mitchell, B & H Motors, for Bolex and Filmo Cameras.





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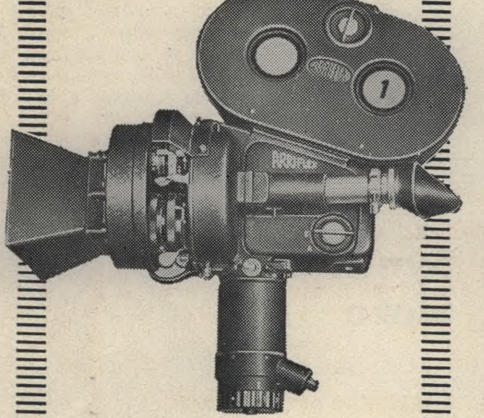
Model 11

A TRULY GREAT CAMERA

for TV, Newsreel and commercial films



For tough and trying assignments, ARRIFLEX 35 is in a class by itself. Reflex focusing through photographing lens while camera is operating—this is just one outstanding ARRIFLEX feature.

Equipped with bright, right-side-up image finder, 6½ x magnification. Solves all parallax problems. 3 lens turret. Variable speed motor built into handle operates from lightweight battery. Tachometer registering from 0 to 50 frames per second. Compact, lightweight for either tripod or hand-held filming. Takes 200′ or 400′ magazine. Write for free folder.

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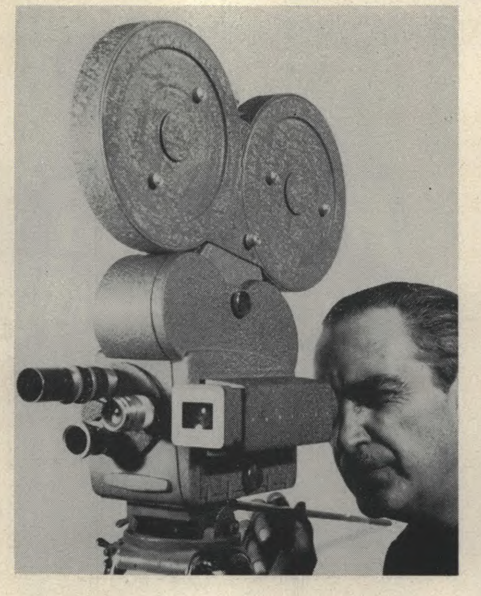
CAMERA EQUIPMENT CO.
1600 BROADWAY NEW YORK CITY

WHAT'S NEW

in equipment, accessories, service

600-ft. Magazines For Cinevoice—Florman & Babb, 70 West 45th St., New York 19, N.Y., offer a king size film magazine for the Auricon Cinevoice 16mm sound camera, giving the professional film maker the advantage of bulk negative supply. The magazine accommodates 400-ft. and 600-ft. rolls of film on cores, as well as standard 100-ft. and 200-ft. daylight loading spools.



Magazine has a noiseless auxiliary takeup motor, velvet-action friction clutch and an insert plate that insures smooth, steady film movement. Use of the magazine does not involve alteration or cutting of camera.

Complete information and price may be had by writing the company, and mentioning *American Cinematographer.*

Film Timer — The Camera Mart, Inc., 1845 Broadway, New York 23, N.Y., is distributing the Camart Electric Film Timer for use in film editing, dubbing, post-recording, narrating, and other film production purposes.

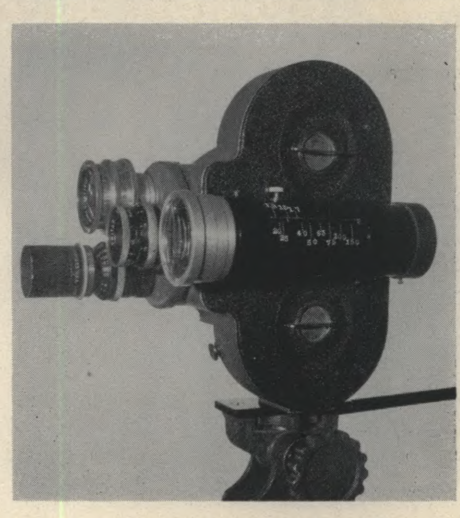
Unit may be permanently connected to projector or film recorder, and wired to start and stop in unison with either machine. Two models are available for 110-v, 60 cycle AC, at $145.00 and $165.00.

Tripod Triangle—Kadisch Camera and Sound Engineering Co., 500 West 52nd St., New York 19, N. Y., announces a new collapsible tripod triangle constructed of heavy aluminum channels and panels. A feature is the special locking device which secures the three tripod legs to the triangle. This prevents tripod legs from "jumping" out of the triangle sockets whenever triangle is moved.

Illustrated brochure and prices are available by writing the company and mentioning *American Cinematographer.*

Zoom Finder—Camera Equipment Company, 1600 Broadway, New York City, announces it will distribute the zoom-type finder for cameras designed by Fred Parrish, Hollywood motion picture equipment engineer.

The finder is adaptable to the Filmo, Victor, Bolex and similar 16mm cameras and is calibrated from 15mm to 6-inches. The same finder also is available for use with single-lens Eyemos and small-turret Eyemos. These are calibrated from 25mm to 6-inches.



Inquiries east of Chicago should be addressed to Camera Equipment Company; those in the west to Fred Parrish, 10851 Fairbanks Way, Culver City, California.

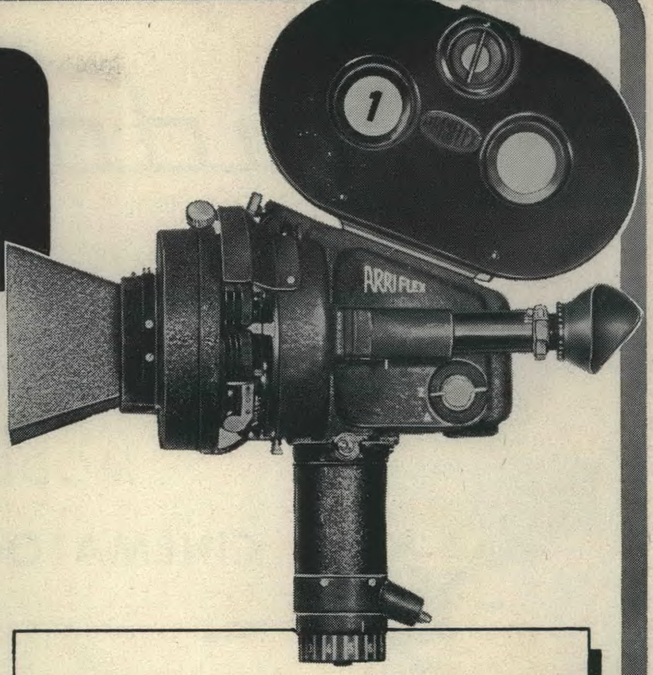
New Telephoto For 16mm—Bell & Howell Company, Chicago, announces a new 3″ f/3.5 telephoto lens for 16mm motion picture cameras. New lens replaces company's 3″ f/4 Telate, and has improved performance and mechanical features.

Lens carries easy-to-read, standard spread-out iris scale having a range from f/3.5 to f/22. Click stops assure positive setting. Depth of field scale is

(*Continued on Page 258*)

☆ ARRIFLEX 35

MODEL II



The ideal 35mm movie camera for TV Newsreel, Industrial, Travel and Scientific Motion Picture Photography.

FAMOUS ARRIFLEX FEATURES:

- Reflex focusing through taking lens, even when camera is running.
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is one of the greatest contributions to the advancement of movie making. Its rapidly growing popularity is sure evidence of its destined success and acceptance wherever movies are at work.

No camera is better suited for stero adaptation than is the Arriflex 35, known everywhere for rock steady pictures . . . every frame in precise register. It is the least expensive camera in the field, the lightest in weight, it easily couples to synchron-motor, and in every other way it is the simplest and most economical way to 3-D movie making.

Available at leading dealers.

Write for literature and price list.

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50mm f/2 Schneider Xenon*	135mm f/3.8 Kilar
75mm f/2 Schneider Xenon*	150mm f/3.5 Kilar
*With Follow-Focus Grips.	300mm f/5.6 Kilar
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LENS EXTENSION TUBE for close-up filming and cinemacrography

HI-HAT for mounting Arriflex 35 on standard tripods

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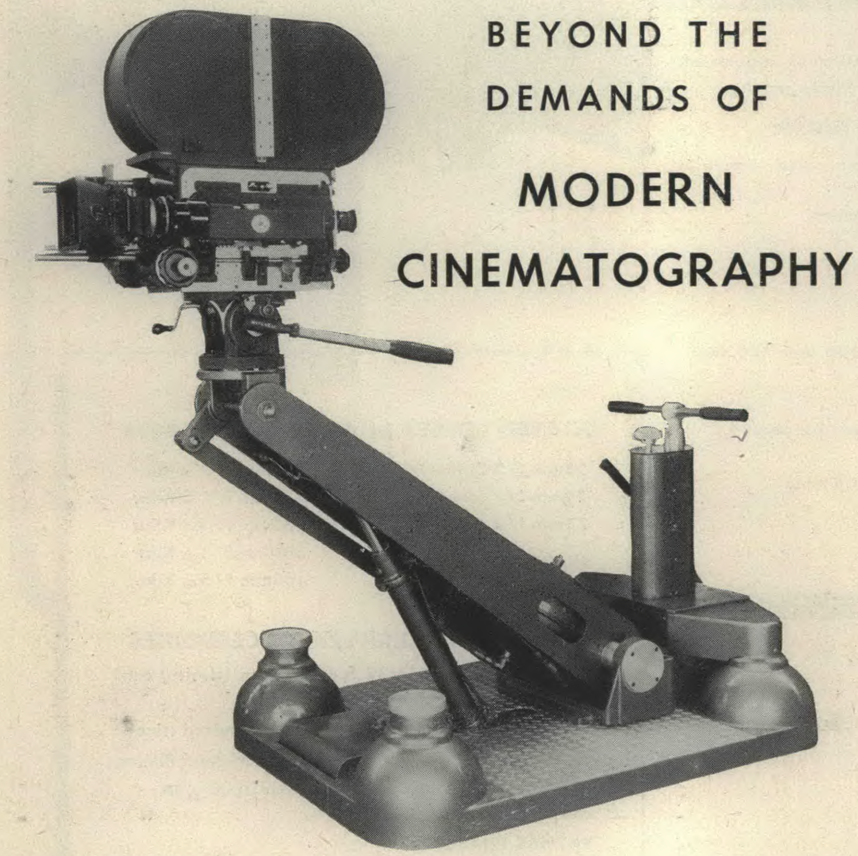
MODERN CINEMATOGRAPHY



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- 4 WHEEL PARALLEL STEERING, PERMITS STRAIGHT LINE MOVEMENT OF DOLLY IN ANY DIRECTION WITH DIRECTION SMOOTHLY VARIABLE AND ANGULAR RELATION OF DOLLY TO CAMERA SUBJECT REMAINING CONSTANT.

ALL THIS AND IT'S EASY TO PUSH!

FOR BROCHURE WRITE

CINETEL PRODUCTS CO.

HOLLYWOOD, CALIFORNIA

BOX 1174 AMERICAN CINEMATOGRAPHER

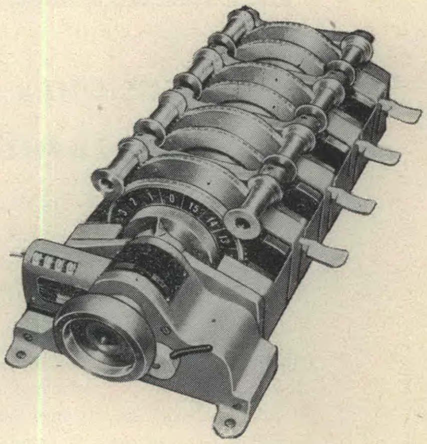
WHAT'S NEW?

(*Continued from Page 256*)

inscribed in red for easy identification. A metal lens cap and sunshade is supplied. Retail price is $79.95.

Film Synchronizer — Neumade Products Corp., 330 West 42nd St., New York 36, announces the Synchromaster film synchronizer as the latest addition to company's long line of well-known film handling equipment.

Invaluable for all types of film synchronization for studio, laboratory, and film exchange, Synchromasters are available in 2, 3, and 4 hub models for both 16mm and 35mm film. Five and 6 hub assemblies are available on special order as are also combination machines for the handling of 16mm and 35mm films simultaneously.



Descriptive brochure and price sheet are available by writing the company and mentioning *American Cinematographer*. END

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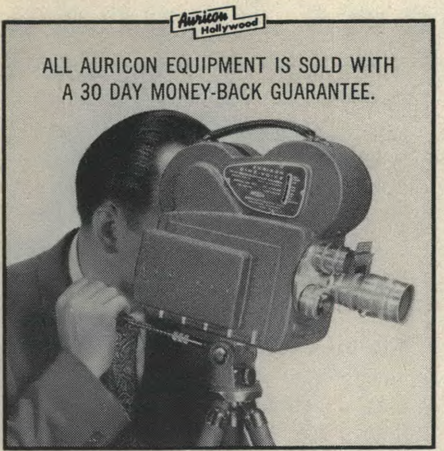

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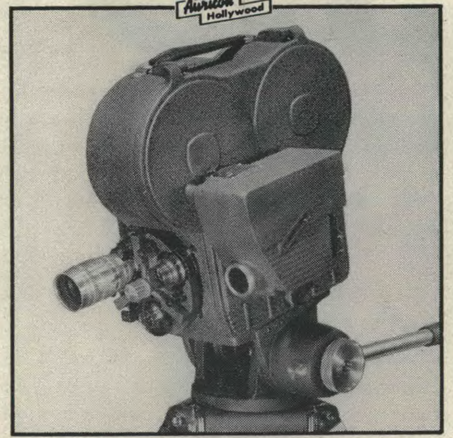

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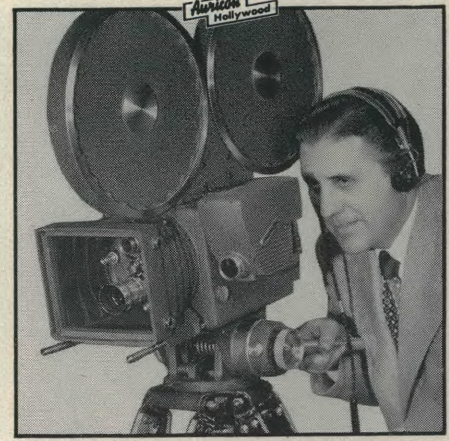

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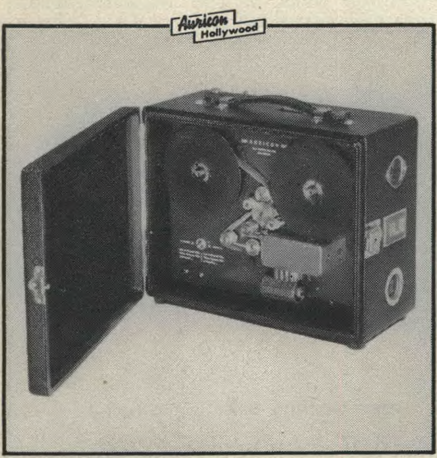

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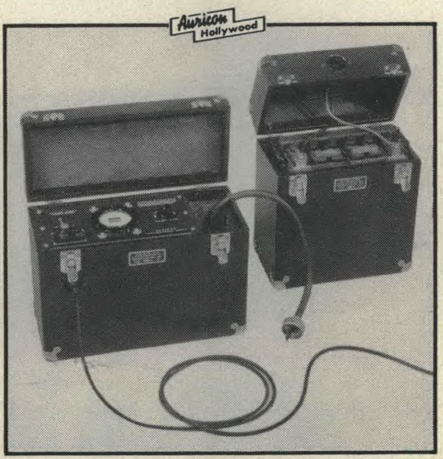

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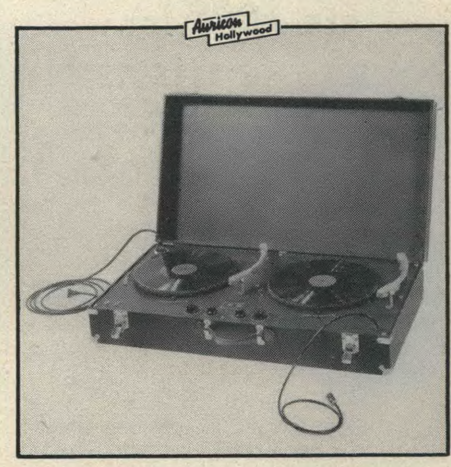

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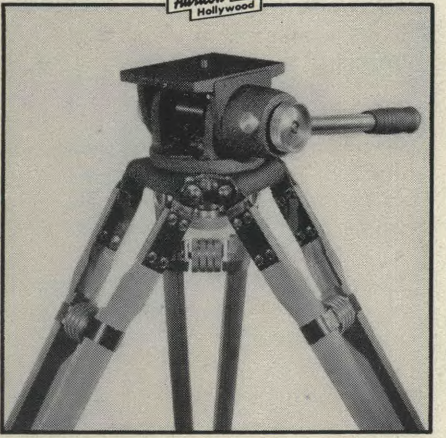

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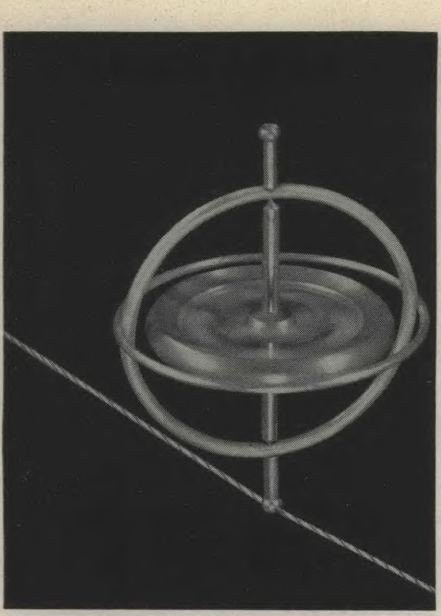

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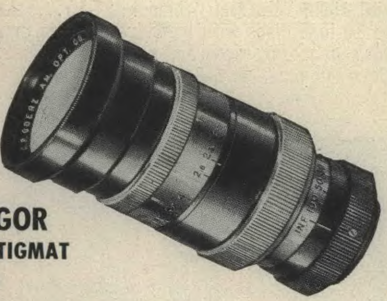

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3-D and WIDE SCREEN News Roundup

Paramount studio technicians have completed first production tests with a new wide-angle camera-lens which takes in a view of 74 degrees, greater than any wide-angle lens used to date. Only Cinerama, accumulating multiple angles by use of a three lens recording camera, gives wider coverage.

•

A new 3-D process, developed by R. E. Schensted of Marshalltown, Iowa, was demonstrated last month before a number of Hollywood studio executives. Process is said to permit full-scale production of 3-D color films at moderate cost, and was developed over 15 years ago.

•

3-D and wide screen projection has put a new demand upon makers of carbon arcs in order to furnish greater volume of lamphouse illumination for theatre projection.

•

Wide screen exhibition of films isn't anything that movie exhibitors couldn't have developed themselves, had they paid less attention to popcorn sales and more to giving patrons better and newer entertainment. And to prove it, one exhibitor has done just that. He is Albert M. Pickus, Stratford, Conn., theatre owner who has built and installed his own screen for showing films with a wide-angle lens in an aspect ratio of about 1.66 to 1.

•

A new system of 3-D photography and projection which uses one film strip, one camera and one projector has been introduced in Hollywood by veteran cinematographer-technician, Friend Baker, who engineered the Natural-Vision 3-D camera. Demonstration of new process in 16mm was given members of the American Society of Cinematographers recently.

•

Stereophonic sound has been dropped from the presentation of Columbia's 3-D "Fort Ti" in Paramount theatre, Hollywood, because of the extra cost involved. Stereo sound required a third operator in projection booth—as provided by Projectionists' union.

•

Wide screen movies go back to the infancy of the industry, according to SMPTE president Herbert Barnett, who says that a 98-foot screen was built and used in 1899. In the 30's, an outdoor panoramic screen was constructed on the curved wall of a building. It was beaded, and about 33 feet high and 196 feet in width!

•

3-D films have been showing in Budapest since July, 1952. The system used is that developed by Hungarian cameraman Feliz Brodrossy. It is a single-film method employing polarized light. But spectators do not wear spectacles; instead, they view the pictures on the screen through polarizing filters mounted on back of the seats in front of them.

•

Using stereo in trick fashion to show off the technical potential of the new screen system, instead of applying the process solely to telling the motion picture story to the best advantage, will kill the novelty, and public interest in it, within a short time, says Rudolph Mate, ASC, who directed RKO's 3-D feature, "Second Chance."

•

20th Century-Fox has purchased Hurley Screen Co. of Long Island. Latter will now manufacture studio's Miracle Mirror screen used in exhibition of CinemaScope pictures. Screen, which has been in production at rate of 24 a day will now be stepped up to 72. Miracle Mirror screen sells for $3.00 per sq. ft. as compared to about $1.10 for the ordinary theatre screen.

•

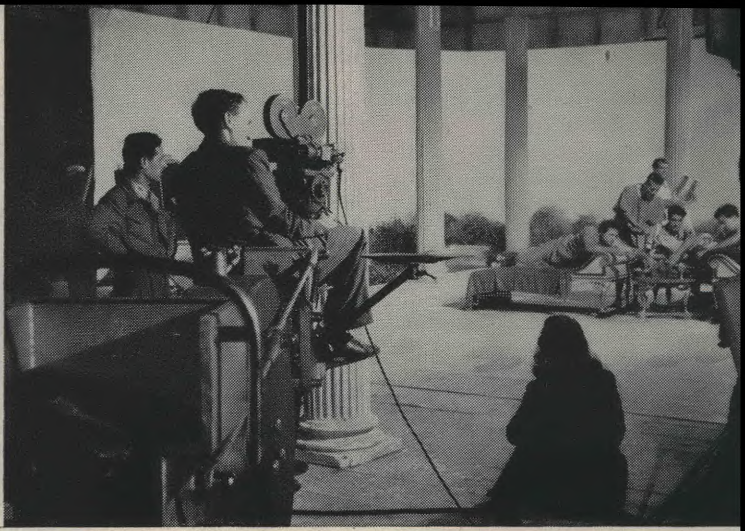
Cinerama has developed a method of reducing its three-print, three-projector system down to a single 35mm print which can be wide-screened with a single projector fitted with a wide-angle lens. Improvement is aimed at giving "general release" to Cinerama productions now restricted to special exhibitor installations.

•

Special effects for 3-D productions are now common practice in Hollywood. More than 1500 feet of special effects in 3-D have been completed at Eagle-Lion studios for Al Zimbalist's 3-D science-fiction feature, "Robot Monster."

GREAT WHEN THE GOING IS ROUGH!

Knowing that his equipment would take a terrific beating from heat, humidity, and the roughest kind of terrain, Lt. Kenneth M. Elk of the U. S. Army Signal Corps chose the Maurer 16mm as the camera best qualified to document the Elk-Combs African Expedition. The Maurer 16mm offers you the utmost in accuracy —in quality—in simplicity of operation. Quite naturally, it is first choice in the professional field.



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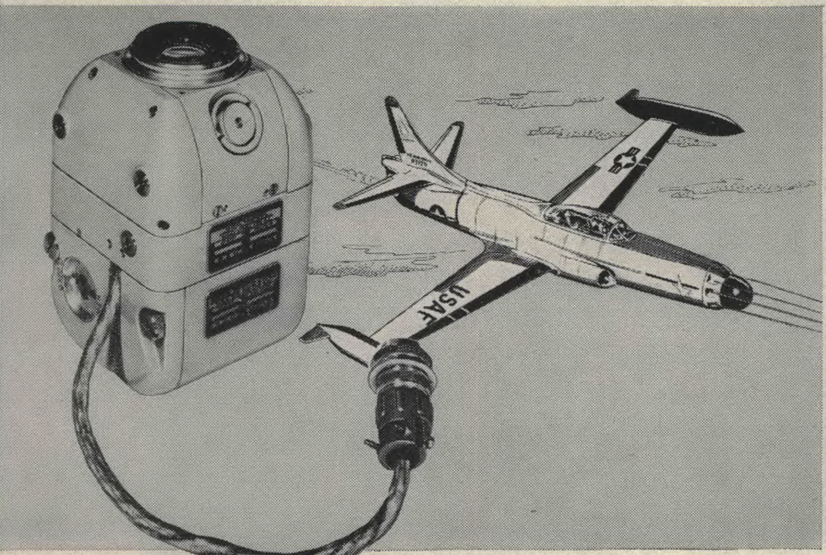

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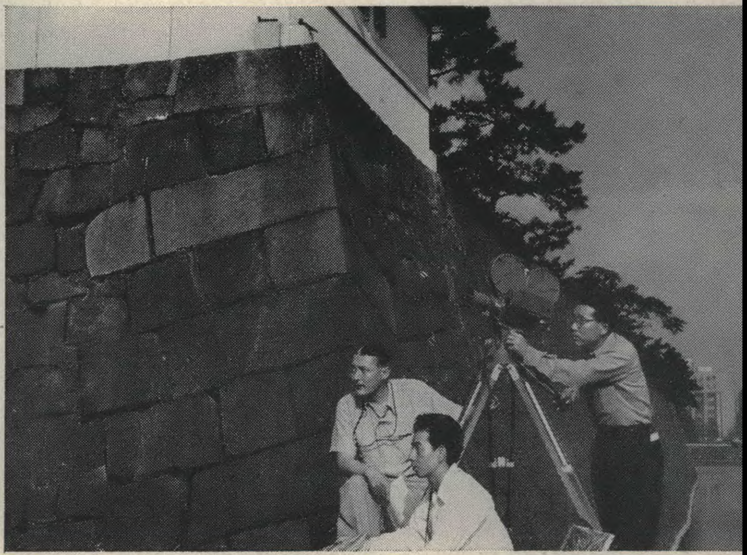

MAURER 16mm AT WORK FOR THE JAPANESE GOVERNMENT

Ian Mutsu, President of the International Motion Picture Company, Tokyo, makes films for the Japanese Government, and United Press-Movietone TV Newsreel. "Thoroughly satisfied with the Maurer '16'," says Mr. Mutsu...as do all the world's top professionals...because it meets so many varied needs, gives top performance under all conditions of light, temperature and humidity.

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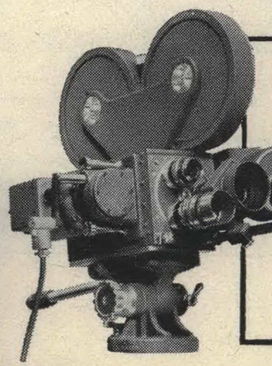

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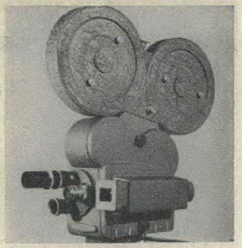

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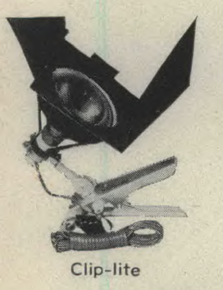

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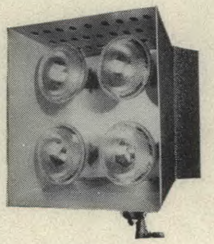
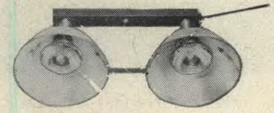


Quad-lite



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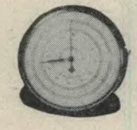

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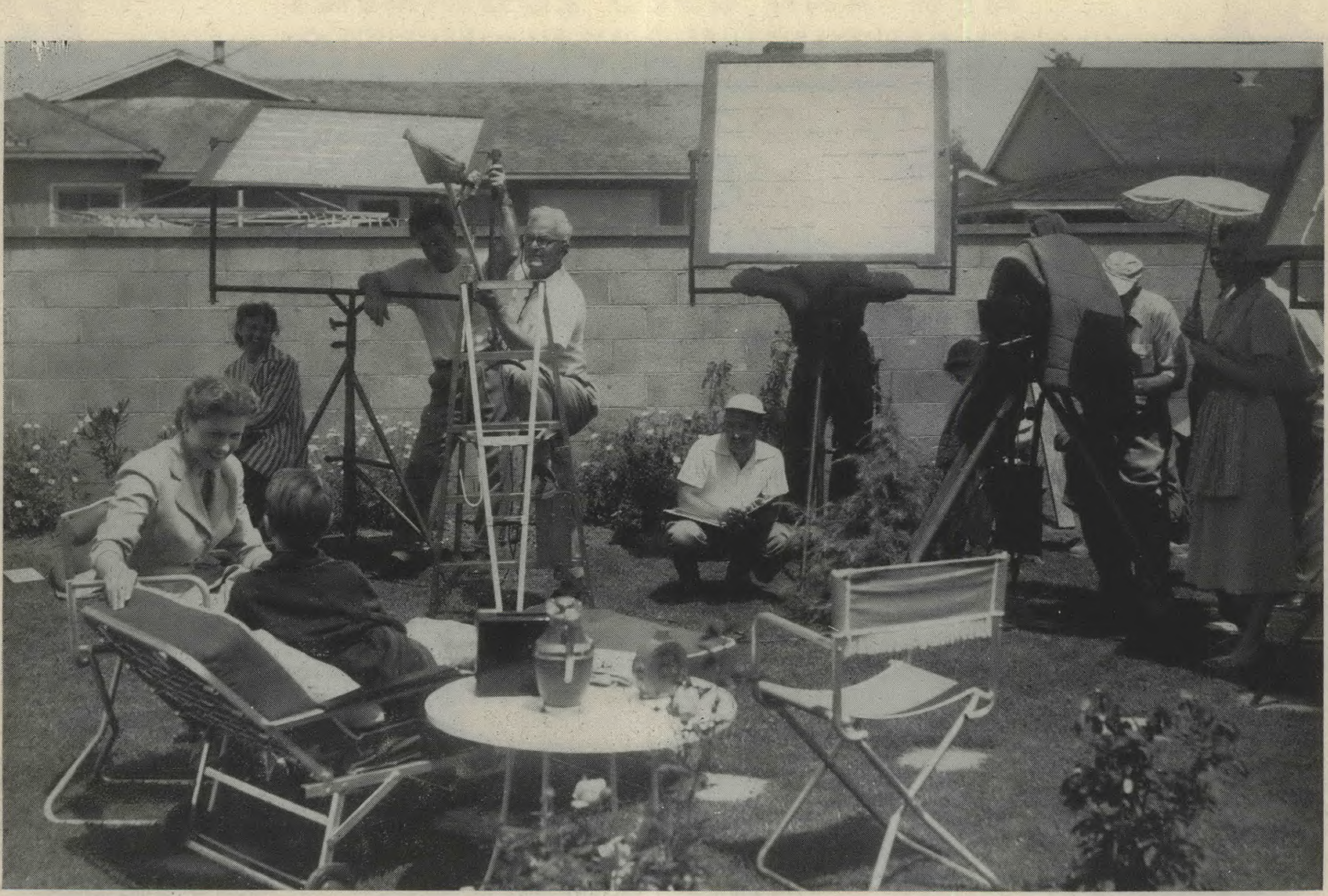


SHOOTING an exterior scene for "Venture Into Faith," 16mm feature-length dramatic film in color. Here studio-type reflectors flank camera on either side to throw fill light into the scene. In center background, wearing white cap is producer-director Herb A. Lightman.

Major Studio Techniques In 16mm Film Production

Behind the filming of "Venture Into Faith" is an exciting story of production achievement and the solving of some unique problems including the lighting of an audience of 15,000 people for color photography.

By CHARLES LORING

"THE PICTURE IS to be a feature-length dramatic film with a modern religious theme. It will be entirely lip-sync dialogue, shot in 16mm Commercial Kodachrome. And by the way, for the climatic sequences, you'll have to figure out a way to light for color photography the interior of a tent seating 15,000 people. It's important that we show all of them in one shot."

The man making the above statement was L. E. "Pete" White, head of the White Advertising Agency, one of the largest in the Mid-west. The man doing the listening was Hollywood producer-director Herb A. Lightman, head of Devon Productions. The picture they were discussing in that conference several months ago is now being launched in roadshow presentations throughout the country. Titled "Venture Into Faith," it has been called by critics "the greatest dramatic religious film ever made."

Behind the filming of this one hour and 32 minutes of sound and color is an exciting story of production achievement and the solving of some unique technical problems, many of which had to be overcome without the benfit of precedent.

The central figure in "Venture Into Faith" is the world-famous evangelist, Rev. Oral Roberts. This dynamic minister conducts a series of monthly campaigns in selected locales through the country. The campaigns are held in what is actually the largest tent in the world, larger in floor area than the famous Ringling Brothers' "Big Top." In a typical campaign, this great tent cathedral is filled each night for 16 nights with crowds ranging from 12,000 to overflow attendance of 25,000. The main challenge to the producer was to capture on film the vast scope of these meetings—while at the same time embodying the uniquely intimate, warmly human essence of Oral Roberts' ministry. The success of these objectives is evidenced by the tremendous audience response the film is enjoying. Not only do audiences alternately laugh and cry unashamedly as the dramatic story unfolds, but each viewer seems to take with him something of the uplifting spirit of the film.

Mr. White's decision to assign the film to a Hollywood producer was brought about by his and Rev. Roberts' desire that the film be made with the greatest possible degree of professional finish. They figured correctly that only Hollywood know-how exemplified by major studio technicians and production methods could achieve this result.

The film is not a documentary, but actually a dramatic photoplay based on a true-life story. For this reason and for better control of the action, it was decided that the bulk of the dramatic sequences would be filmed on the sound stage—while the sequences showing the tent meetings would be shot wherever the campaign happened to be in progress at the time—in this case, Birmingham, Ala. Since the entire script is devoted to the story of a single typical American family seeking Faith—and since the family would appear also in the tent sequences, it was evident that not only technicians but the principal players of the cast, as well, would have to go on location to Birmingham.

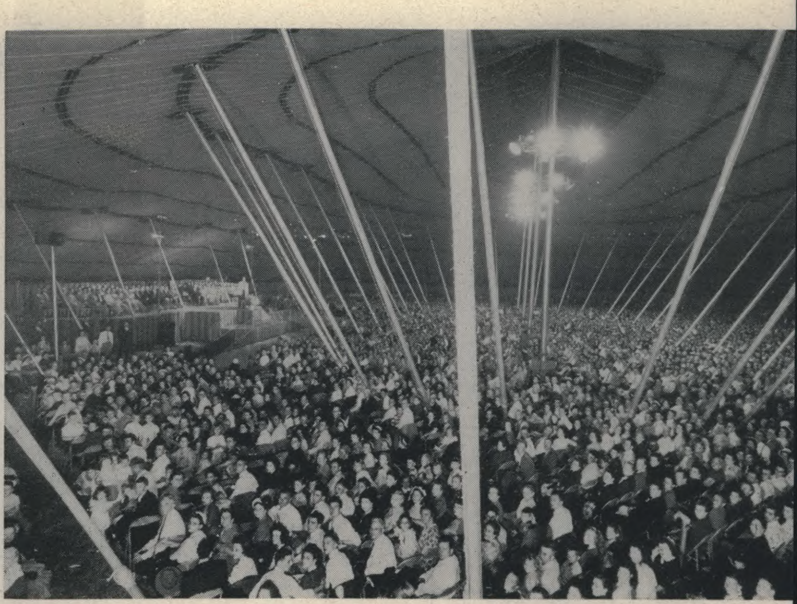
The Birmingham sequences presented enormous technical problems. It is a well-known fact that Cecil B. De Mille had shipped many tons of lighting and generator equipment to shoot tent sequences away from the studio for "The Greatest Show On Earth." In addition, he had available the full technical facilities in the industry—plus *unlimited budget.* By contrast, the producer of "Venture Into Faith" was faced with having to shoot sequences of equal magnitude on a budget that was greatly limited, to say the least.

The producer and camerman hied themselves to New York to gather lighting and technical equipment needed for the Birmingham shooting. The budget allowed for rental of only about one third the number of lighting units that should have been used to do the job ideally. Much plotting indicated, at least on paper, that with proper placement and overlapping of light units, the equipment engaged could be made to cover. When presented with this diagram in Hollywood, chief gaffer Roy Black gave a long low whistle, then admitted that while nothing like this had ever before been done, he felt that by dint of much prayer and luck it might actually be possible. These elements, coupled with long experience, plus a good supply of old-fashioned elbow grease put out by Roy Black, two other Hollywood gaffers, and several master electricians hired locally, produced the result. An area 330 ft. by 210 ft. was lighted with only 20 Senior (5 kw) lamps and 10 Sky Pans, to permit an adequate exposure in the long shots of f/2.

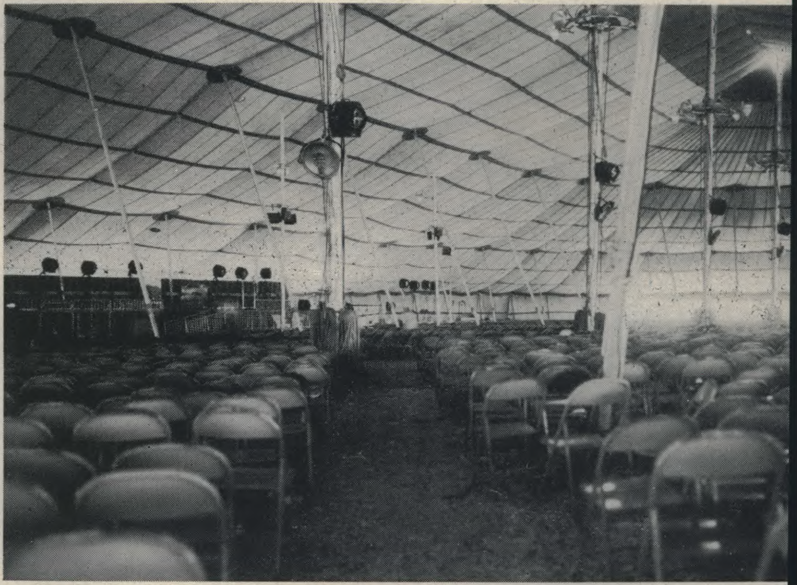
But lighting was not the only major problem. The plain truth of the matter was that while a film of sweeping magnitude was to be filmed in Birmingham, the main purpose of the meeting was to hold a religious campaign. Film or no film, nothing could be allowed to intrude into the solemn atmosphere of the religious services.

This meant that shooting had to be done as unobtrusively

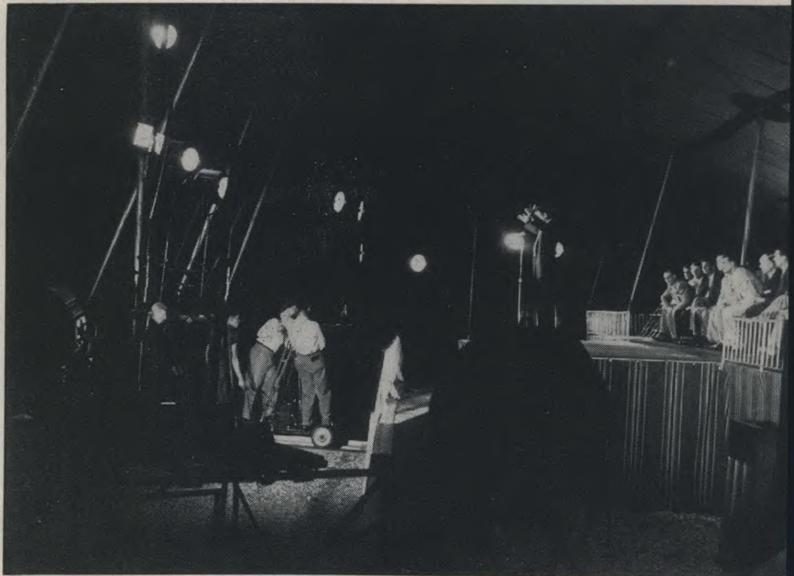
(Continued on page 290)



MAJOR PROBLEM was lighting this vast tent—bigger than any circus big top—in order to photograph the huge audiences that listened nightly to evangelist Oral Roberts.



SENIORS AND SKY PANS were mounted high on the central tent poles to give ample light coverage for the many long shots that were made inside the tent on 16mm color film for "Venture Into Faith."

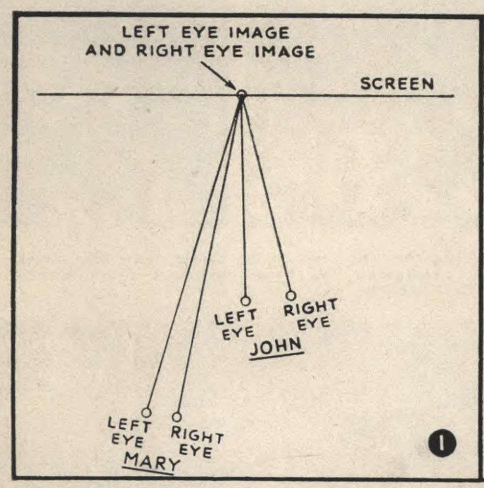


LIGHTS AND CAMERA are rolled into position for closeups of Rev. Oral Roberts in action on the platform. Scene was shot while evangelist was lecturing in Birmingham, Alabama.

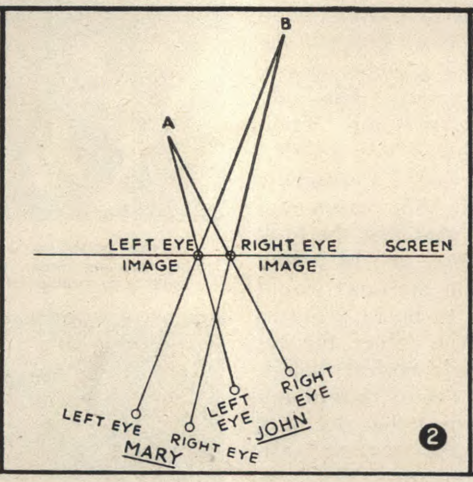
Some Basic Principles Of 3-D Cinematography

THE DIAGRAMS below, which illustrate some of the basic natural principles of 3-D photography and the problems that arise from them, are reprinted through courtesy of *The Daily Film Renter*, London, England. They are based on designs prepared for lecture demonstration by Floyd A. Ramsdell, well-known American authority on streoscopy.

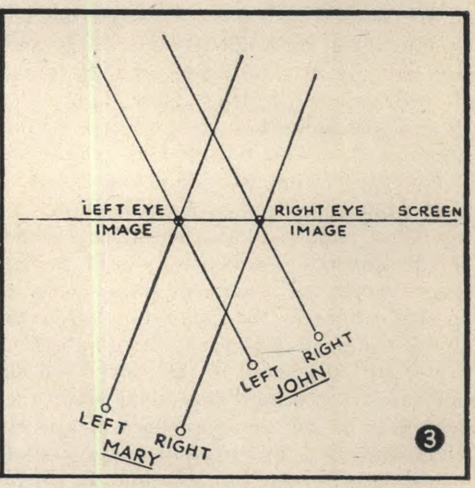
While screen width and height are fixed by the size of the screen, depth—that is, the distance an object appears to be behind or in front of the screen—will vary for each person in the audience. Depth can be controlled at will by the photographer, Mr. Ramsdell says, and, because it can be so seriously distorted, requires the most careful study.



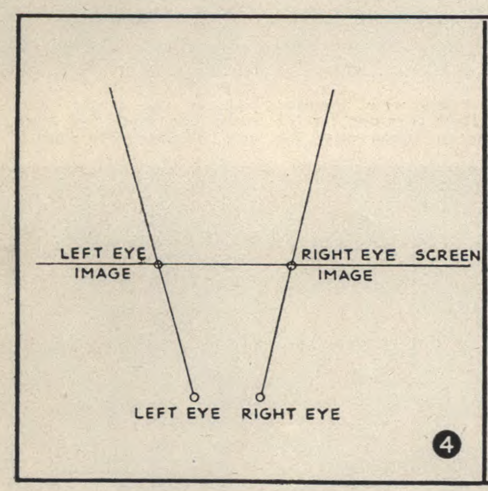
In the simplest case, left and right eye images exactly superimpose on the screen when viewed without polarizing spectacles. When observing 3-D through pola-viewers, each eye is still led to the same spot on the screen. Hence, that object will seem to be at the screen at identically the same place for everyone in the audience—for John, sitting in the 6th row, and for Mary, sitting in the 12th row.



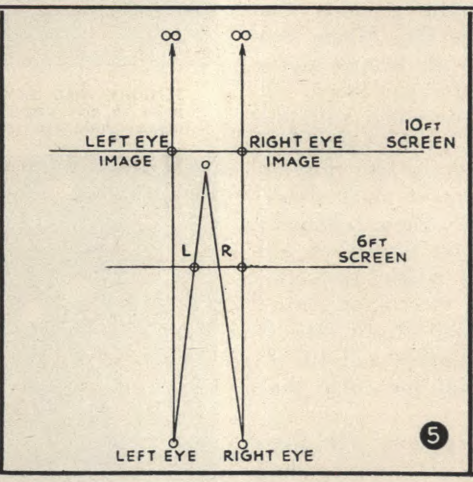
Left and right eye images, when viewed without pola-viewers, appear separated on the screen. When viewing through polarizers each eye is directed to its particular image. The point at which a line passing through right eye and right eye image fixes the distance the object seems to be behind the screen. Here A is object as seen by John; B for Mary.



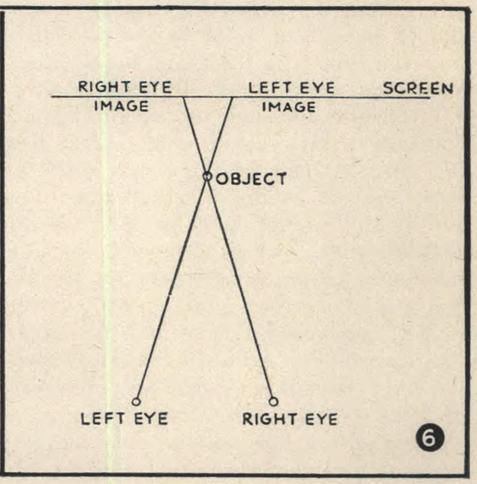
Here, the left eye image is separated from the right eye image by exactly the same distance as that between pupils of two human eyes. Because pola-viewers channel each eye to its respective image, these lines of sight are parallel. Since parallel lines meet at infinity, the object will seem to be at infinity for everyone in the audience. The object will have a different location laterally for Mary than it does for John.



What makes viewers of 3-D movies sometimes complain of eyestrain? If left and right eye images are separated by more than the normal interocular distances (2½″) the pola-viewers will try to turn the eyes outwards—a feat impossible for normal eyes. Left and right eye screen images of the object farthest from the camera must never be more than normal eye separation when projected on the screen.



Importance of correct screen size for 3-D is illustrated here. In this case, the pair of projected images on the 6-ft. screen represent an object that is a reasonable distance behind the screen. When the same image is projected on a 10-ft. screen, there will be greater separation. Thus we see that separation of lens axes in the camera is definitely related to size of screen on which resulting dual images are projected.



One other problem is of interest when considering the location of the images on a screen: in this final case, the right eye image and left eye image are reversed at screen position; but, again, the polarizing viewers channel each line of sight to its correct image. Since, in this instance, these lines of sight intersect in front of the screen, the object will appear to be in front of the screen.

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One Camera, One Film For 3-D

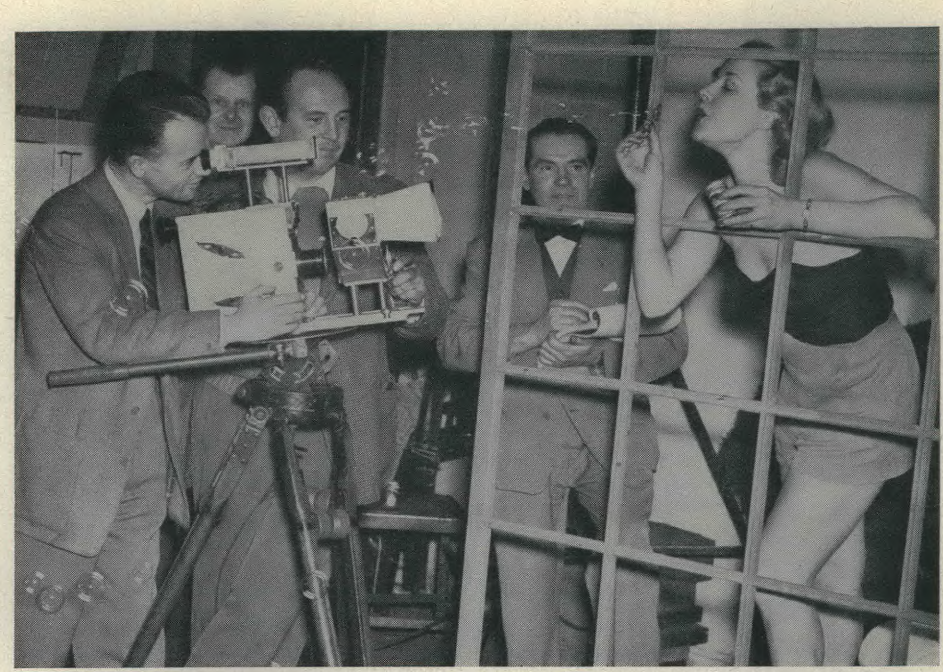
Single camera fitted with a simple prismatic attachment is said to do everything that a dual-camera, twin-film 3-D system will do.

NOT ALL THE ACTIVITY in three-dimensional motion pictures is in Hollywood despite the fact it remained for the U. S. film capital to give 3-D movies their first real impetus. Interest, if not actual production, in 3-D films is world-wide and some of the most interesting 3-D cameras have originated in Europe.

One such camera, noted for its unique departure from the usual dual-camera arrangement is that designed by Leslie Dudley of London, and which is described in the March 19th issue of *Kinematograph Weekly*, British industry trade paper.

The Dudley camera and 3-D filming system is being sponsored in 35mm production. He plans to produce a monthly magazine feature film in 3-D plus a feature in color-3-D of the Coronation.

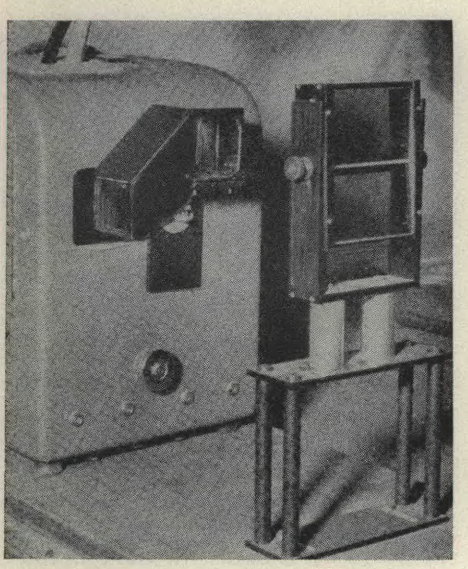
The Dudley 3-D system involves but one camera and one strip of film. A British Newman-Sinclair 35mm camera is fitted with a simple prismatic attachment which mounts in front of the camera lens, and receives right and left eye views, rotates them through 90 degrees, and registers them half-size on the film within the space of a single normal frame. All the complications of linking together two cameras are avoided.



LESLIE DUDLEY'S single-camera 3-D filming system utilizes a British Newman-Sinclair 35mm camera fitted with prismatic attachment that receives right and left eye views, rotates them 90 degrees, and registers them half-size on a single frame of film. The negative is processed and printed like any flat film.—Photo courtesy Kinematograph Weekly.

Corrections for parallax are embodied in the attachment, and, it is claimed that for optical reasons, it is possible for the camera to be much closer to the player or actor than with other 3-D filming systems. The negative is processed and printed like any 2-D or "flat" film.

To screen the single-strip 3-D films made with this camera, a special stereo-attachment is fitted to the theatre projector. The attachment, through a system of prisms, rotates the two images on the film, enlarges them, polarizes them, and superimposes them upon a normal size screen. The attachment is mounted in such a way that it can be tilted back whenever it is desired to screen flat films. It is scheduled to be available for general distribution within the next thirty days, and will be supplied to theatres on a rental basis.



DUDLEY'S prismatic attachment mounted on a Bell & Howell 16mm projector. System of prisms rotates the dual film images, enlarges and polarizes them, and superimposes them upon the screen.

To the film exhibitor, the prime advantage of the system is that a feature can be shown with normal changeovers, and without the interval necessary with two-film 3-D systems for rethreading. All problems of interlocking the projectors are eliminated, the only adjustment necessary being the optical system previously described. The screen required, of course, is the customary metallic-surfaced screen for polarized light, and polaroid spectacles must be worn by viewers, as with other dual-image 3-D processes.

"The idea is so simple," says Mr. Dudley, "that we hope it will standardize three-dimensional systems of the type requiring pola-spectacles for the audience. It will do everything the two-film 3-D systems can do."

The Dudley system lacks one advantage inherent in the double-film systems, where the light coming from two arc lamps serves to offset the losses due to double polarizers. However, it is expected that use of more efficient screens will compensate for such losses.

Dudley points out that while it is undoubtedly desirable that all theatres should be equipped to handle prints of the same type—whether of the single-film —or double-film system—he agrees that there is no reason why films produced on two negatives should not be optically printed to a single film. The undoubted advantages to the exhibitor of a single-film system make this method of producing 3-D films desirable, if not ultimately imperative, believe's *Kinemotograph Weekly's* reporter.

Meantime, the search goes on apace by inventors the world over for a practical 3-D method that will eliminate

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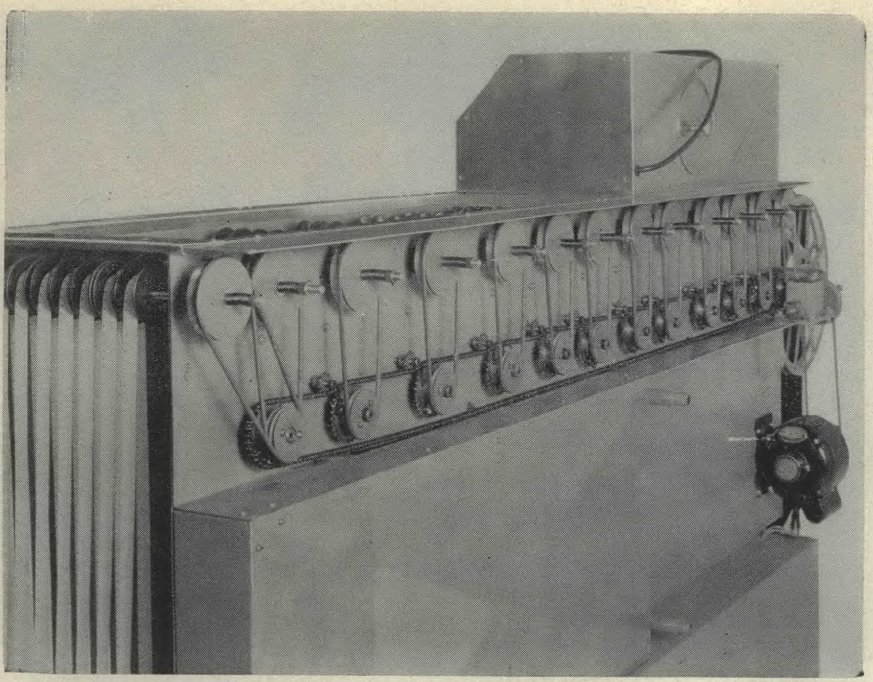

FIG. 1—Bridgamatic drive compartment with cover removed, showing individually driven phenolic, yieldable clutch pulleys. Unit is reasonably tamper-proof and requires no special skills to operate.

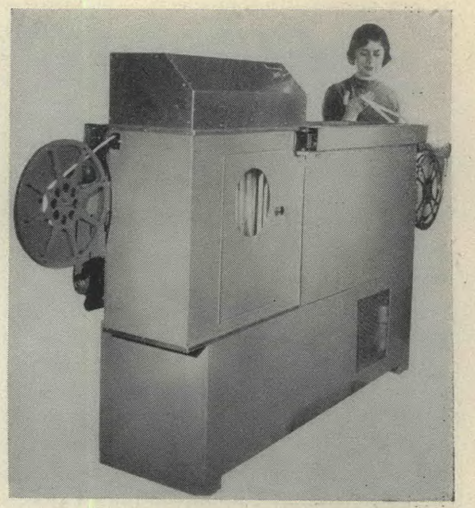

FIG. 2—Operator inspecting film before making quick splice which can be done while machine is running.

The Bridgamatic Developing Machine

Ideal for television stations and small laboratories is this reasonably priced, self-contained, automatic add-a-unit film processor, which embodies standard commercial design plus many unique features.

By JOSEPH A. TANNEY and EDWARD B. KRAUSE
S.O.S. Cinema Supply Corp., New York

THE GOAL OF SMALL film production units has long been quick processing. It has been attained by some, like the big-city television stations which telecast "spot" newsreels of the day's events the same night. Many racetracks, too, project an entire event within a few minutes after the finish. But the equipment cost has been almost prohibitive for educational institutions, small producers and commercial film studios catering to the lesser television stations.

The Bridgamatic was designed to fill this need for a compact, self-contained automatic processor. After several years of experiments, a practical, simple drive mechanism was designed which would be reasonably tamper-proof and require no special skills to operate. It was planned that with intelligent handling it should keep the film moving for hours without much operator attention, other than changing reels. Exposed film was to be fed into one end so it would emerge at the other end, developed, fixed, washed, dried and reeled ready for projection or printing. This seemed at first a comparatively easy problem; but because film stretches when it is wet and again contracts when it dries there is a constant and continuous variation in its linearity. It was found that a fixed speed drive would not take care of this without manual readjustment while the machine is running. So, the overdrive system was adopted.

This equipment operates through the medium of two separate drive systems combined to produce an overdrive on the upper banks of rollers (Fig. 1), thus eliminating any troublesome drive components immersed in the solutions. The basic drive consists of a chain which is driven through a conventional gearbox and a drive motor. This in turn drives a series of chain sprockets synchronously, one sprocket for each bank of rollers in the machine. Permanently affixed to each chain sprocket is a laminated bakelite phenolic pulley of the same diameter. This serves as a connecting medium to the secondary drive system, thus providing the means of operating the upper banks of laminated phenolic bakelite pulleys. A belt connects the upper and lower pulleys, thus making the lower synchronous pulley the actuating medium and the upper pulley the driven medium.

REPRINTED by permission from the March, 1953, Journal of the SMPTE. Original paper was presented on October 8, 1952, at the SMPTE convention at Washington, D.C., by the authors.

Attached to each upper sheave is a yieldable friction clutch. These upper driven pulleys decrease in diameter from the feed-in end of the machine through the drybox to the take-up. This tapering diameter sheave system increases the peripheral speed of, and induces an overdrive in, the upper banks of rollers, each bank rotating at a greater rate than the one behind it, and so on throughout the entire machine. The yieldable friction clutches hold the overdrive in check, and will not allow any unnecessary strain or pull on the film strands at any time. Each clutch is adjustable as to tension by a tempered compression spring held by a locking collar. Significantly enough, these springs in themselves contribute little to produce the overdrive in the Bridgamatic machine.

This overdrive is mathematically calculated when the pulleys are made —the amount of overdrive is positive for the life of the machine and has no dependency at all on critical spring pressures or other fine adjustments. Through this means of transmission it is also possible to vary the amount of overdrive at any one section of the machine. For instance, in the extremely long machines used for color processing, it is possible to eliminate completely the overdrive tendency in the drybox where the film is contracting while it is drying. In the usual types of Bridgamatic machines for small laboratory use, the overdrive is carried through from the film entry point right to the take-up reel. Even the film in the drybox has an overdrive working there which is also controlled by the yieldable clutches. The springs on the clutches are merely sufficient to place the upper banks of rollers in operation and the overdrive automatically takes over from there. This action takes place continuously in all sections of the machine, even though the movement is normally imperceptible.

Each individual bank or group of rollers is adjustable to tension by releasing the locking collar setscrew using an Allen wrench and compressing or releasing the spring as necessary. An overall adjustment can be made quite easily and simply. The film is hand held at the feed-in end and the machine is started. Each bank of rollers will in turn automatically stop rotating. The film is then released and the rollers are observed as they resume driving. Each bank should start successively without hesitation the moment the tension is released. The first should start, then the second, and so on, until the take-up reel is turning and the entire machine is in operation. If there is any lagging, the cycle is repeated to locate the offending bank, then the lock collar is loosened and more spring tension applied as necessary to that particular section.

When this drive system was being designed one of the requirements which seemed important was to keep the drive mechanism completely clear of any chemical contact with solutions. Another important item was to keep the machine as wide open as possible and free of complicated covers and inaccessible places. This was solved by enclosing the entire mechanism in a separate housing of its own (Fig. 1) where it is completely out of sight and away from solutions, tanks, etc. The entire film roller assembly can be removed from the machine in a half hour with nothing more than an Allen wrench. This provides for simple periodic cleaning of the tanks and rollers if necessary without a total breakdown of the machine with its attendant lay-up period.

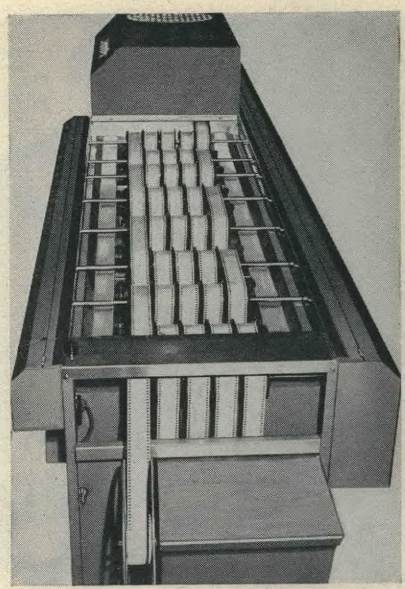

FIG. 3—Top view of Bridgamatic 16/35mm machine showing straight-line design. All major parts are readily accessible.

Tests made at the factory with this type of drive showed that it was possible to run single 8mm film through the machine without any film breakage. A splice using only one staple did not let go throughout the entire process. By alleviating the stresses and strains, this machine's drive exerts so little driving torque that it produces a very clean film product and reduces abrasion marks on the base side of the film to an absolute minimum. Test

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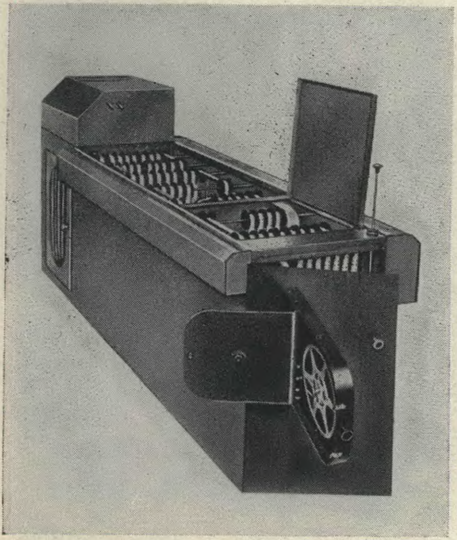


FIG. 4 — Bridgamatic TV Reversal model showing daylight magazine (back to open door), feed-in elevator, and light-tight cover.

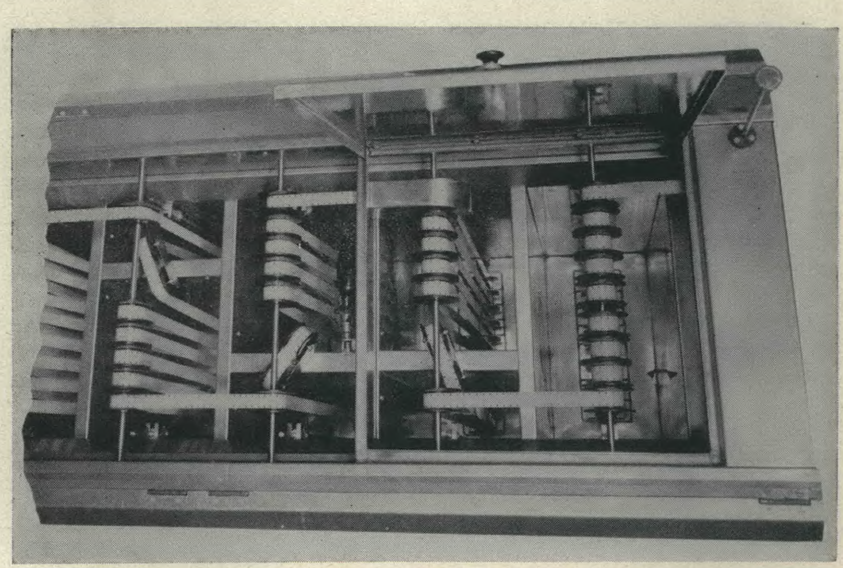


FIG. 5—Top view, showing interior of stainless steel tanks, nylon bearings stainless steel shafts and other parts of inert materials. One master switch controls operation of entire assembly, including heater and dry-box.

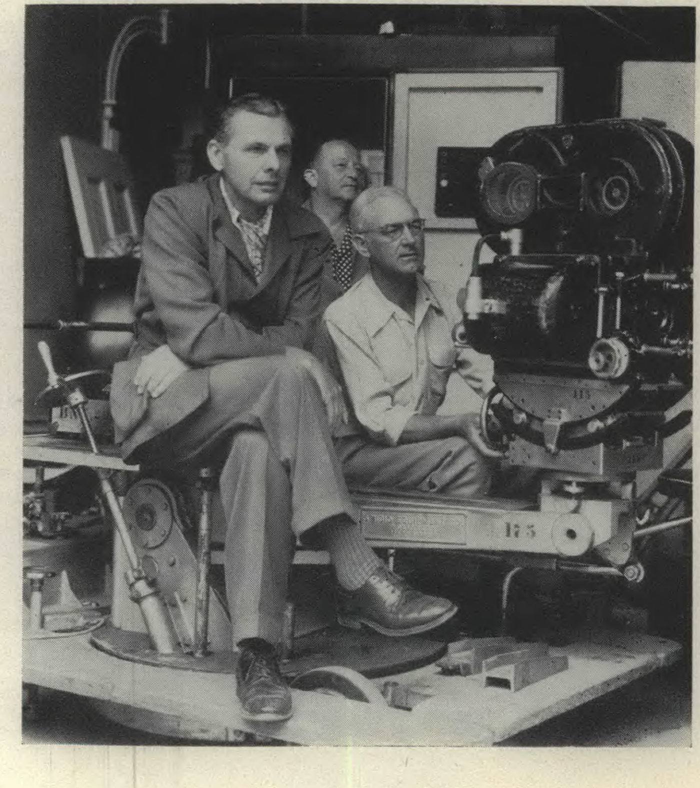
Who's Who In TV Film Photography . . .

DON MALKAMES, ASC, (right), who shoots the Ralph Bellamy "Man Against Crime" CBS-TV film series in New York, was first cinematographer to use the new Type 927 DuPont film. Malkames, pictured here with Bellamy (center) and DuPont's Al Cushman, examines test roll of new stock which is on thinner base and reportedly is 2½ times faster than DuPont Type 2.

WALTER STRENGE, ASC, (above, right) who directs photography of the "My Little Margie" TV film series for Roland Reed Productions, is seen here chatting between takes with Margie's screen father, Charlie Farrell (left), and actor Clarence Kolb. Strenge is one of TV film industry's veteran cinematographers.

JIM VAN TREES, ACS, who shoots the "Groucho Marx Show" (NBC-TV), gets in the act, too, during pre-shooting warmups with audience. It's all a gag when Groucho asks Jim to tell audience why Groucho must don coat of special color when show starts, then persists in interrupting as he tries to explain. Finally Jim pulls card from pocket and reads prepared technical explanation, which confounds even Groucho.

JACK GREENHALGH, ASC, (below, left) is another of the growing number of veteran studio cameramen to cast their lot with TV film producers. Greenhalgh directs the photography of Family Films' "This Is Your Life" series of half-hour religious TV films. With him are operator Ernest Smith and assistant Bennie Coleman.



A New Camera Dolly For Films And Television

New Multidolly offers greater flexibility for the cameraman.

By KARL FREUND, A.S.C.

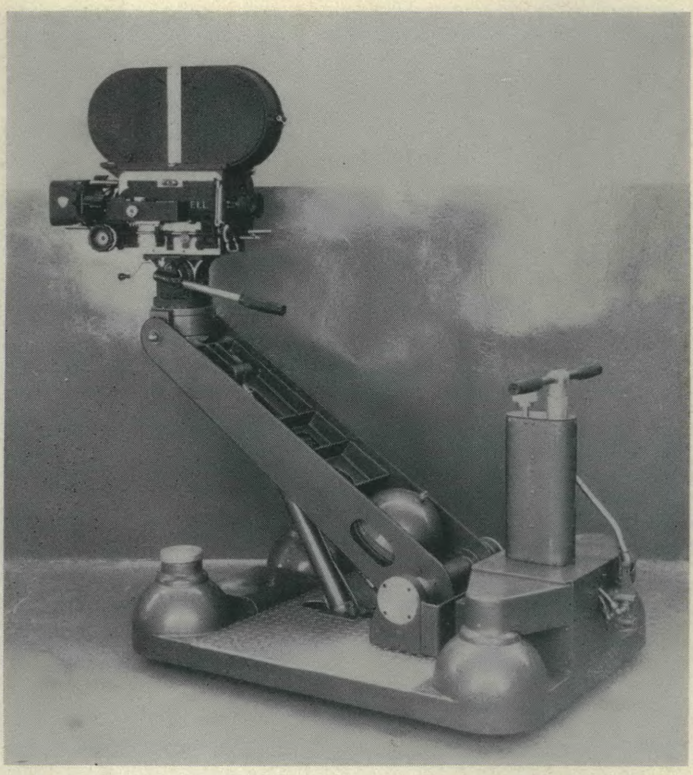


FIG. 1—Low-slung chassis is just one of many features of the Multidolly, newest baby mobile mount for film and TV cameras. Other features are differential circular steering and hydraulic boom control.

A NEW ITEM OF CAMERA equipment, the Multidolly, is a recent Hollywood development which offers to directors of photography a new flexibility of camera motion. Shown to the public for the first time last month at the National Convention of Radio and Television Broadcasters in Los Angeles, this new design has been planned for use by both motion picture directors of photography and television program directors.

Weighing slightly more than 500 pounds, and capable of carrying one or two men with the camera equipment, the Multidolly was designed to provide the maximum in convenience for everyone concerned with its use. From the director of photography who needs frequently to check the camera lineup, to the grip concerned with moving the dolly relative to the camera subject, the entire crew will find this equipment has been planned for efficiency.

From the early days of television the lack of spacious stages on which to work has created a new concept of camera motion for that medium. The first requirement was that the dramtic quality of the programs be held to a high level photographically, and that this be done under the combined handicap of small stage facilities and small camera supporting equipment.

In Hollywood and other film making centers of the world the limitless material appetite of television has had its effect, and the evidence of this is the increasing number of short-duration, low budget films being produced by both the major studios and small independent organizations. The mammoth camera cranes which have been a part of the Hollywood scene for so long are immediately ruled out by the term "low budget" because the expense involved in using such equipment increases in approximate proportion to its weight and bulk. So in such film production the transition to the use of small, extremely maneuverable camera supporting equipment has kept pace with the origin and development of television camera techniques using similar equipment.

The parallel that is evident in the camera technique of

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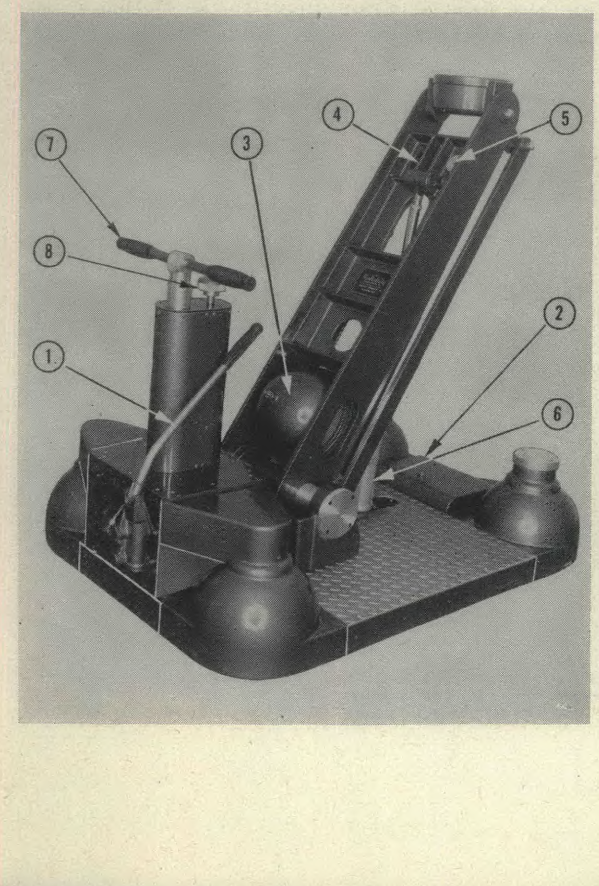


FIG 2—Basic hydraulic circuit of Multidolly: (1) hand pump; (2) fluid resevoir; (3) pressure accumulator; (4) pressure gauge; (5) valve; and (6) cylinder. Boom is lowered by releasing hydraulic pressure from cylinder.

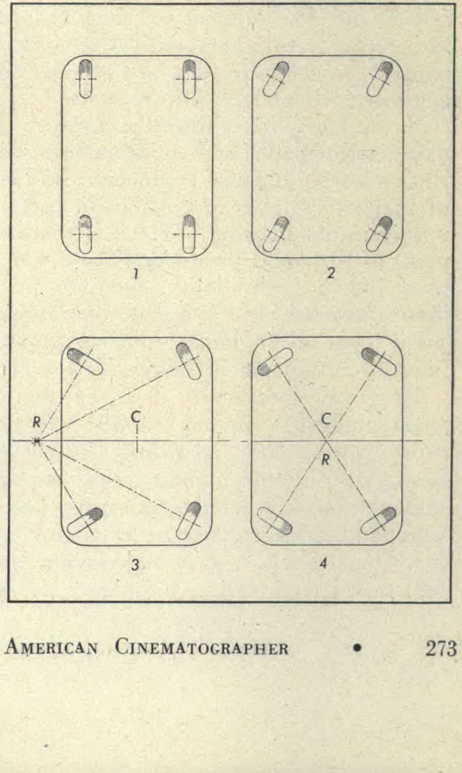
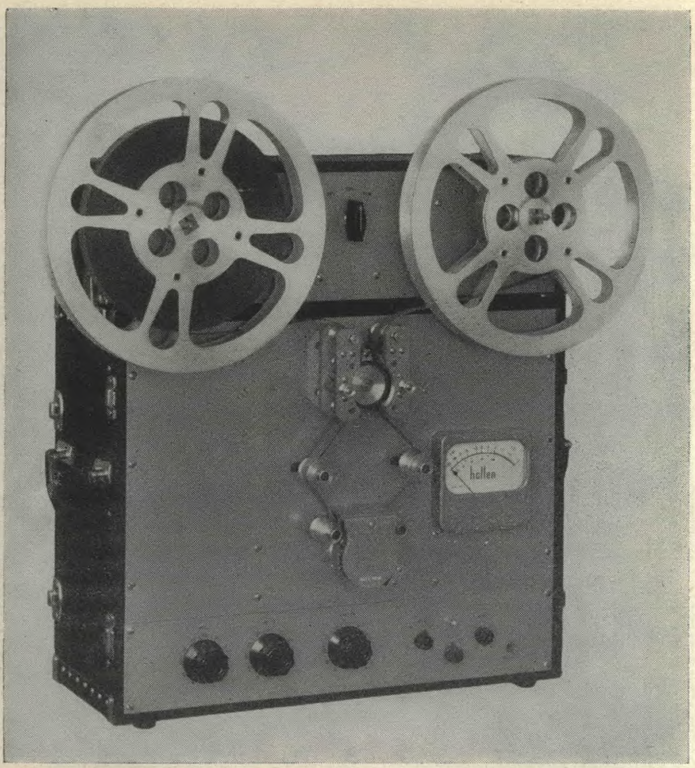


FIG. 3—Diagrams at right show wheel positions of Multidolly for the two optional steering methods afforded: Neutral position is shown at (1); position for parallel steering is shown at (2); No. 3 shows relative position of wheels for circular travel, while pivoting action requires wheels to be set as shown at (4).

The Hallen Magnetic Film Recorder

Complete "lip-sync" recording system in one package.

By HAL POWELL
Hallen Corporation, Burbank, Calif.



THE HALLEN model 25-B magnetic recorder is a rugged single-case unit weighing 73 pounds. Easily portable, it breaks down simply and quickly into three separate pieces for operation.

IN 1946, ONE OF THE most significant advances in the art of sound recording was introduced in this country, that of inducing a magnetic field on either a wire or metalically impregnated cellulose tape. True, experiments along this line had been made in the United States as early as 1930, but all had been discarded as either impractical or unworkable. However, following the electronic advances during the war years, the importation of the basic system from Germany fell into facile hands and upon fertile minds. A new recording medium, and a valuable one, came into being.

The engineers of the Hallen Corporation of Burbank, California, recognized this new method of recording as being of particular value to the motion picture industry, and research and development was begun on a "lip-sync" magnetic film recorder using standard film stock coated with a ferrous oxide. From this project evolved the Hallen, America's first commercial magnetic film recorder.

In the seven years since the appearance of the first Hallen, many refinements and modifications have come forth from Hallen developmental engineers. And as industry acceptance of magnetic film recording grew, certain basic precepts and requirements became obvious, particularly from the standpoint of the small producer. There was strong need for more than just a high-fidelity, medium priced recorder; rather there was need for a simple-to-operate recording *system*, complete from microphone inputs to playback monitor. Such a piece of equipment is today's Hallen Model 25-B.

Designed specifically for the motion picture producer whose budget is limited but who will not sacrifice fidelity of reproduction, this recording system has features usually found only in the highest priced equipment. It is licensed under the patents of the American Telephone and Telegraph Company, Western Electric Company, Inc., and those of Hallen Corporation. It is lightweight and rugged, consistent with good engineering practice. All specifications are well within the standards adopted by the Motion Picture Research Council Standards Committee.

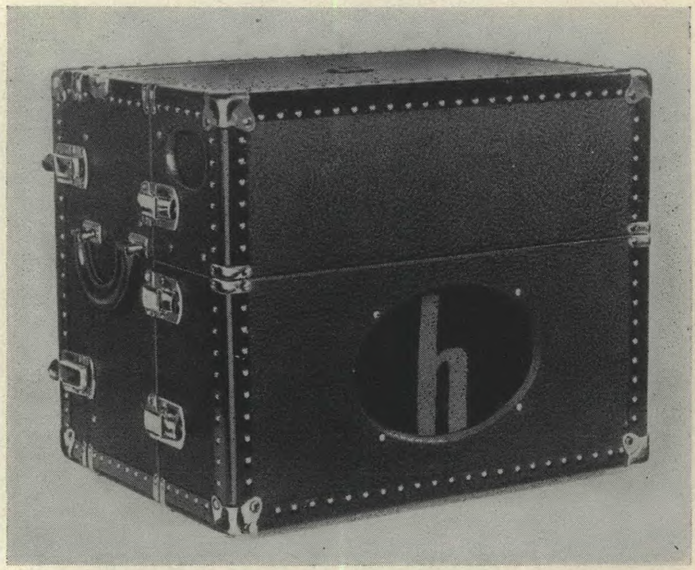
The Model 25-B packages into a rugged single case weighing seventy-three pounds. Easily portable, it breaks down simply and quickly into three separate pieces for operation. The back of the case is made up of two sections, one housing a 6" x 9" oval speaker and a power supply, the other, the take-up and rewind motors. The latter plugs into and clamps firmly onto the top of the remaining section which contains the mixing and recording controls, as well as the film transport mechanism. In operation, the speaker-power supply unit may be located at a distance from the recorder itself.

Three separate motors are provided, thus preventing any of the take-up irregularities being transmitted back to the drive motor. It also eliminates the engaging and disengaging of any gears or belts. The only gears in the unit are on the drive motor, and these are quiet-running nylon gears with hand-lapped worm for smooth operation. All motor leads terminate conveniently and centrally to allow remote switching if desired, while switching on the unit itself has been simplified to a single three-position control.

The system is so designed that it may even be played in "sync" in reverse if desired, to spot a take or make a fast recue. Reverse transfer is sometimes desirable to reduce the "clipped" effect of the noise reduction attack in optical transfers, and in the playback of certain non-standard tracks.

There are also three separate inputs to the Hallen recording system, and they may be used simultaneously. Two mi-

(Continued on page 287)



REAR VIEW of the Hallen 25-B. Back of the case is in two sections. One houses a 6" x 9" oval speaker and power supply; the other, the takeup and rewind motors. Latter mounts on top of main section.

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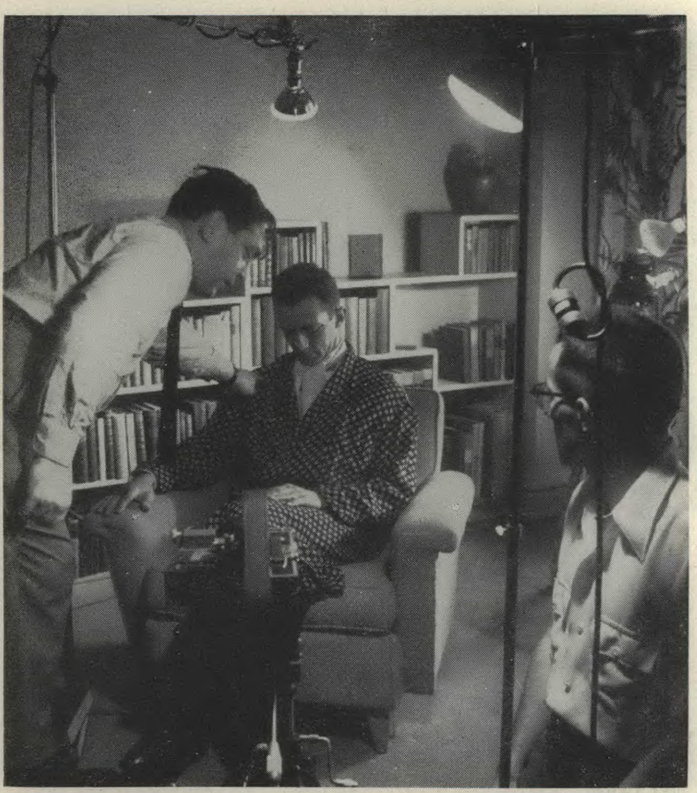
Student Movie Makers

How a serious student class achieved best results working in a small group in which every member was given an active part in each production.

By ANN MEUER



A PROFESSIONAL instructor can greatly reduce the time necessary to learn camera angles and lighting techniques. Here a professional lighting result is achieved with reflector-floods, properly placed.

WERE YOU EVER in a class of students trying to make a movie where perhaps ten work seriously on the project, while the others stand around not knowing what to do with themselves?

It happened to me—and, when I talked about it, I discovered there were others who felt as dissatisfied as I with the average cinematography class. It wasn't only the size of it, but also the fact that we had no part in selecting the problem to be worked on—no sense of excitement or participation in the work. We decided to form our own movie making class.

Our first job was to be very sure about our own aims. We wanted a manageable working group in which each person could play an integral part. We wanted in our group only those who had something to say and felt they had to say it on film—people who could work with and help each other. Our first objective, then, was a small eager group. Now, we think we have the ideal set-up—our own movie class of ten students who have pooled their cameras, lights, and other equipment.

In setting up our class, we talked to many people in the professional movie field and asked about some person who might be willing to give us the instruction we wanted. Our most important need was to get a teacher who would not tell us how to do it his way, but would help us to express our own ideas. We selected Peter Glushanok, a professional camerman who has made many fine films. At first, we were afraid he might be too busy to give us enough time; instead, he usually gives us more time than agreed upon, because of his belief in, and enthusiasm for, the objectives of the group.

(Continued on page 292)

THE STUDENT, in hands of a competent instructor, learns value of resourcefulness—as here in using two bricks to give added support to tripod-mounted camera on location.

THE MOVIE maker also must be his own gaffer, know how to run cables, make good connections, and at same time not overload circuits so blown fuses will result.

TODAY'S cine photographers prefer reflector photoflood and spot lamps for illuminating interiors, ideal when used with Alligator Clamps for easy mounting on stands, furniture, etc.

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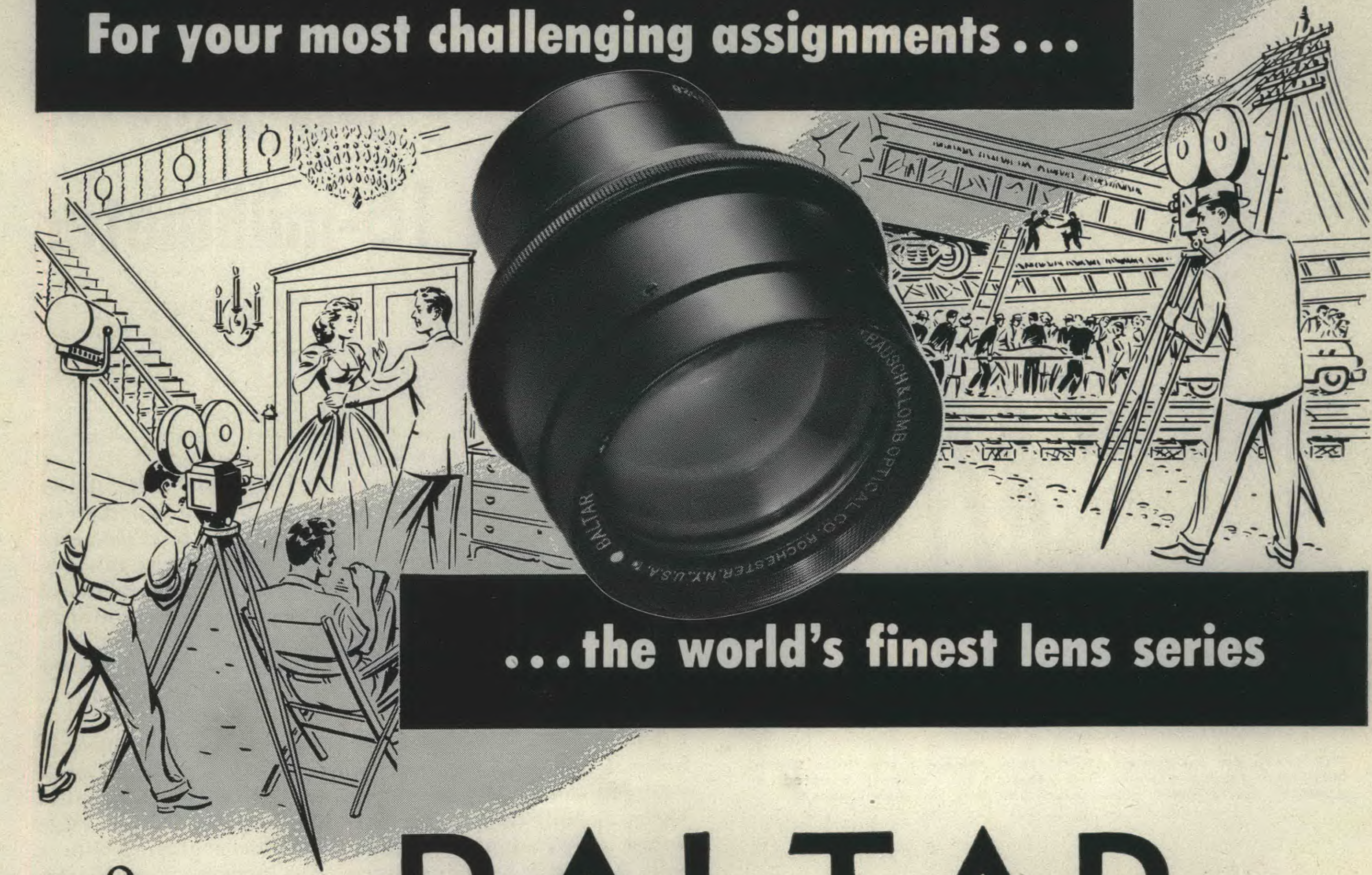
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How To Shoot 3-D Movies In 16-millimeter

By ERNST WILDI

Bolex Division, Paillard Products, Inc.

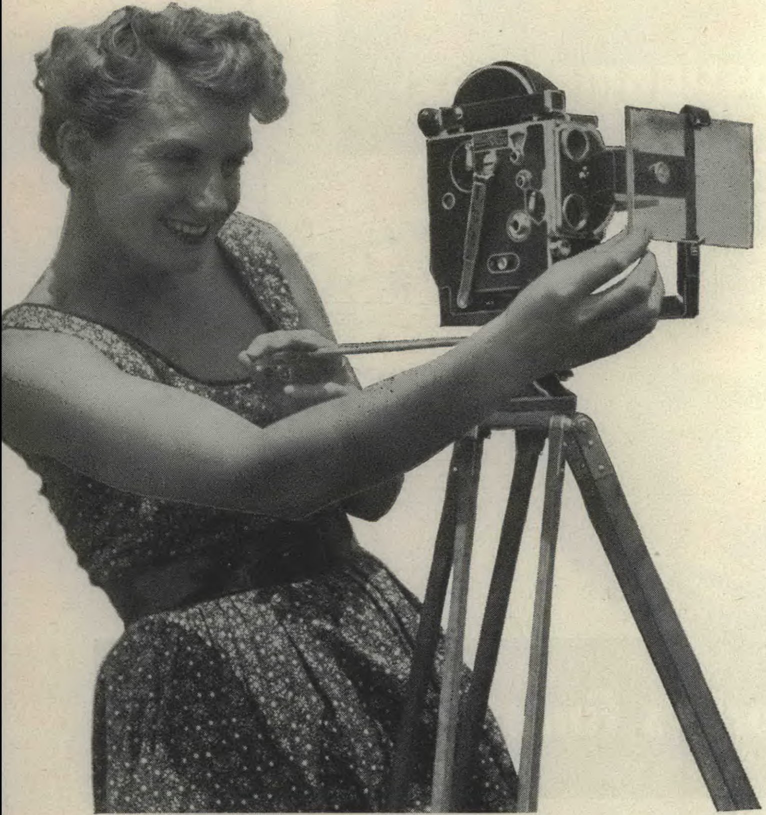

FIG. 1—To prevent thrown objects from damaging the Bolex stereo lens when filming extreme 3-D effects, the author mounted a panel of shatter-proof glass before the lens, as shown above.

IT WAS INEVITABLE that amateur movie makers should want to fall in line with the professionals and make three-dimensional movies, too. With the new Bolex Stereo equipment, owners of Bolex 16mm DeLuxe cameras can turn out stereo movies having all the photographic quality of a Hollywood 3-D production.

With more and more Bolex owners acquiring 3-D attachments, it is estimated that by the end of the year there will be a formidable number of 16mm 3-D films completed by both amateurs and professionals. Many of these are expected to be exhibited at American Cinematographer's first annual 16mm 3-D Film Festival to be held in Hollywood next January.

With so many 16mm filmers contemplating making 3-D movies, it is natural that many questions should arise regarding this type of movie making with sub-standard cameras. How does one proceed in shooting a 16mm 3-D movie? What are the problems, if any, that may be encountered?

Actually, there is little difference between shooting ordinary movies and three-dimensional movies. The fundamental difference between the two lies in the projection. In stereo you no longer look at a picture projected onto the flat surface of a screen. The screen disappears and in its place we have an "open window." Animate objects captured on film can be behind the window, or appear to jump or shoot through the window out into the audience, providing visual thrills that only stereo can give. How this is achieved is simply a matter of choosing the correct distance between subject and camera when shooting the picture.

Now what is the *correct* distance? Imagine that 10 feet in front of the camera (measured from film plane) there is set up an imaginary wall having an open window 26 inches wide and 34 inches high. This opening is equal to the area that will be included in scenes filmed with Bolex Stereo at 10 feet. Imagine, too, that all your scenes are filmed through this open window. Whatever objects are behind the window will, in projection, appear to be behind the plane of the projection screen; all objects that are placed between camera and window will appear to be out in front of the screen.

The simple rule to remember, then, is: Have no object in front of the imaginary wall unless it can physically move through the open window. This rule requires some examples. The wall and window theory is illustrated in Fig. 5. Here we see a girl whom we shall call Kathleen playing with a ball—a good subject for stereo. The camera is set 20 feet in front of her. As the camera is started, Kathleen, throwing the ball in the air or bouncing it, walks toward the camera —16 feet, 14 feet, 12 feet, and finally to the 10-foot mark where is established the imaginary wall. Because of it, Kath-

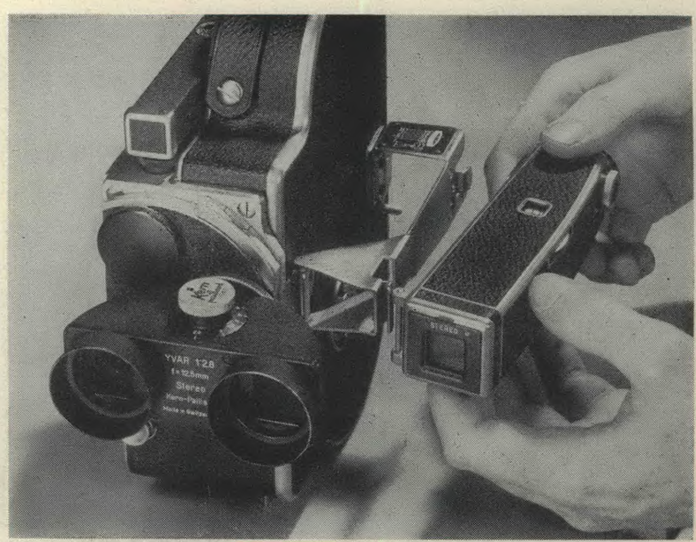

FIG. 2—The Bolex Stereo taking lens may be used only with the Bolex DeLuxe H-16 camera. Here the stereo mask has been clipped to front of the Octameter finder, which is then attached to the offset bracket for filming 3-D movies.

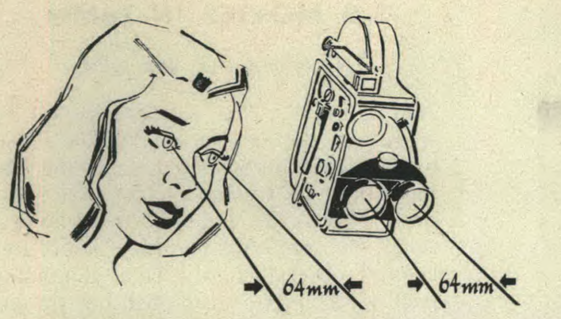

FIG. 3—Bolex stereo lenses have the same interaxial spacing as the interocular measurement of the average pair of human eyes, essential for distortionless 3-D movies.

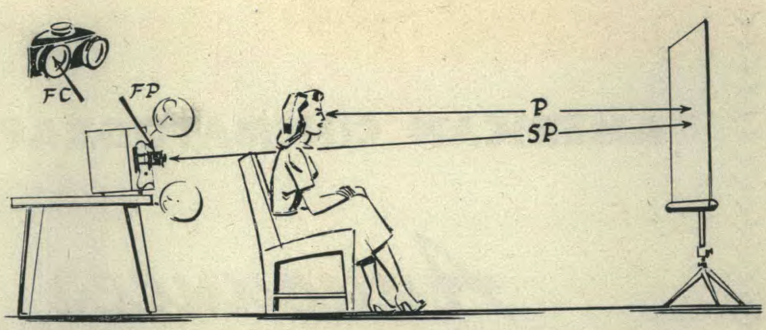

FIG. 4—For ideal viewing of Bolex stereo films, the observer must be seated close to the axis of projection, and at a distance from screen of about five-eighths that of the projector.

leen can walk no closer. At that distance, however, the camera can capture a nice three-quarter portrait of her.

While Kathleen should not *walk* closer to the camera, there are many other things she can do. For example, she can extend through the window her arm holding the colored ball in her hand. In projection, this action would give the extreme depth effect and her arm would appear to extend from the screen and out into the room. Or, even more effectively, she can throw the ball through the window into the audience, who instinctively duck their heads or reach out to catch the ball.

Summarizing: Because of the wall, Kathleen cannot walk closer to the camera than 10 feet, but she can perform at a closer distance anything that can be done through the open window. This rule applies to any subject matter. A tree, for instance, definitely must be behind the wall; however, a single horizontal branch of the tree can appear to extend through the window. Again, a scene of Kathleen on a swing is most successfully shot in a fashion that allows her to swing through the window, with her legs approximately 5 to 6 feet away from the camera in closest position. In making a shot of this kind, care should be taken that the rope of the swing, or Kathleen's legs, do not cut the frame of the window, otherwise the depth effect will not be 100 per cent convincing.

Other good examples of typical 3-D action are: A stream of water from the gardener's hose appearing to drench the audience; a tennis ball, golf ball, or baseball zooming out of space; multicolored soap bubbles blowing out into space, etc. Almost everyone who has had the chance to see stereo movies will agree that action played through the stereo window is the most spectacular; therefore, the 16mm filmer should try to include dramatic shots of this kind in his stereo movies.

In all the examples described above, where an object either moves quickly through the window, or where the only thing that is desired is the depth effect, there is no close limit in regards to distance. In fact, it is better if the object moves directly into the camera lens . . . for example, a ball thrown directly at the camera; water coming directly from the garden hose, etc.

To film such extreme action, it is advisable to provide a suitable guard in front of the camera lens and the Stereo attachment to protect them from damage that might occur if struck by thrown objects. For this I have designed an attachment for my camera that holds a 5″ x 7″ panel of safety glass in front of the camera lens. This is pictured in Fig. 1. The gadget has proved entirely satisfactory, having withstood thrown tennis balls, apples, stones, and arrows, as well as having protected my camera and lens from water.

In shooting stereo movies, the object is to create the illu-

(Continued on next page)

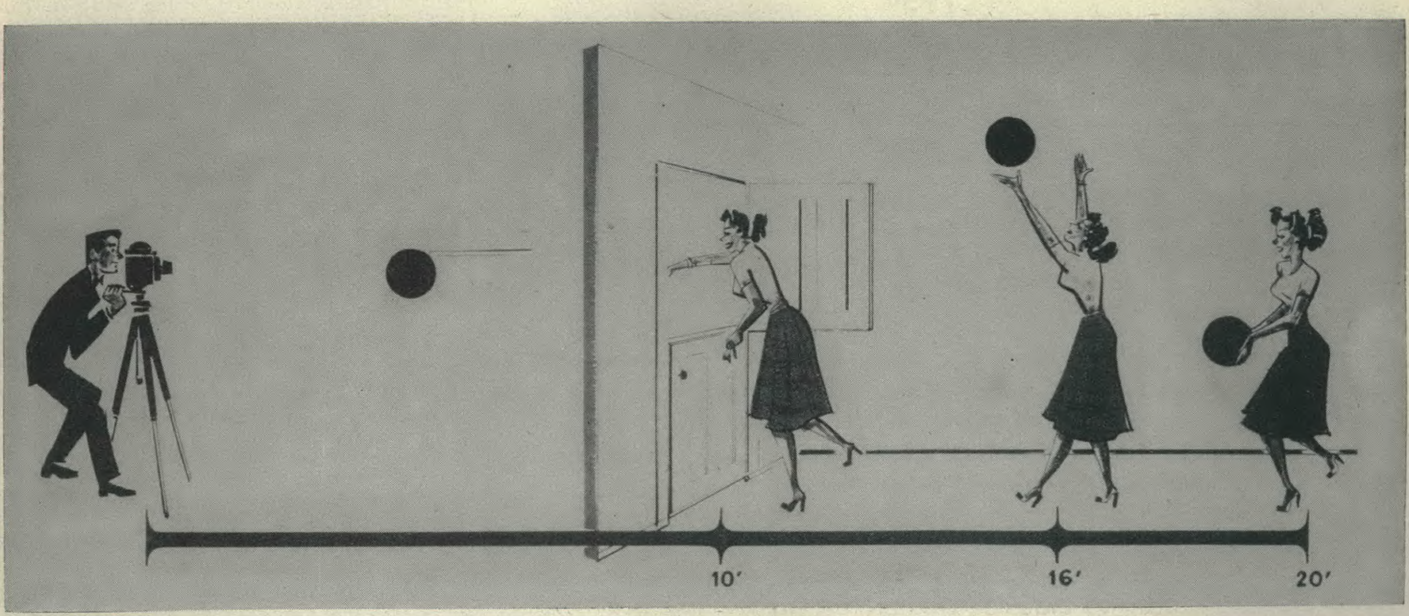

FIG. 5—Illustrated above is the imaginary "wall-window" limits that should be followed in filming Bolex Stereo. The wall, at 10 feet, is the forward limit to which a subject may approach camera. The window represents the actual "stereo window" back of which all normal action should be kept, except when extreme effects are desired —then objects are hurled, extended or allowed to protrude beyond the 10-foot limit, or through the "stereo window."

—Illustrations courtesy Bolex Reporter.

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3-D MOVIES IN 16MM

(Continued from page 279)

sion of depth. This is best achieved by setting up the camera so that the scene to be filmed includes a foreground object 10 to 15 feet away from the lens. Such objects as a fence, tree, flower, rocks, etc., are ideal for this. Such foreground objects should be a dominant part of the picture composition, should be well lighted, and should be of a light color. Where a suitable foreground object is not readily available in the scene, substitute some member of the family or a friend. Have them *walk into the scene* at the desired point—never pose them looking directly at the camera, as is ordinarily done for a still shot. And have subjects dress in vivid colors for color film.

In doing pictorial still photography, it is common compositional practice to have a tree trunk and branches *in the shade*, as a foreground silhouette nicely framing a distant view. In stereo, it is much better to have the tree in bright sunlight because dark, shadowy areas do not add to the three-dimensional effect. For the same reason, when making stereo scenes indoors, background walls should be lighted so that they become part of the overall picture, adding additional depth. The correct amount of light to throw on a background wall can best be determined with an exposure meter. The lighted background should give approximately the same meter reading as the main subject. In short, the general rules for lighting interiors which are standard practice for regular movie work can be followed in shooting stereo.

A complicated lighting setup is not as essential in stereo as in regular movie making, because in stereo, depth is created automatically and does not require any artificial help or emphasis, such as tricky side or back lighting.

The procedure described above (keeping subject 10 feet or more ahead of camera lens) brings up the question about shooting closeups in stereo. A regular movie without closeups gives the impression that something important is missing. Not so with stereo. Closeups (at less than 10 feet) are much less important because stereo movies are so real and fascinating. In fact, it is possible to produce an excellent stereo movie having not a single closeup.

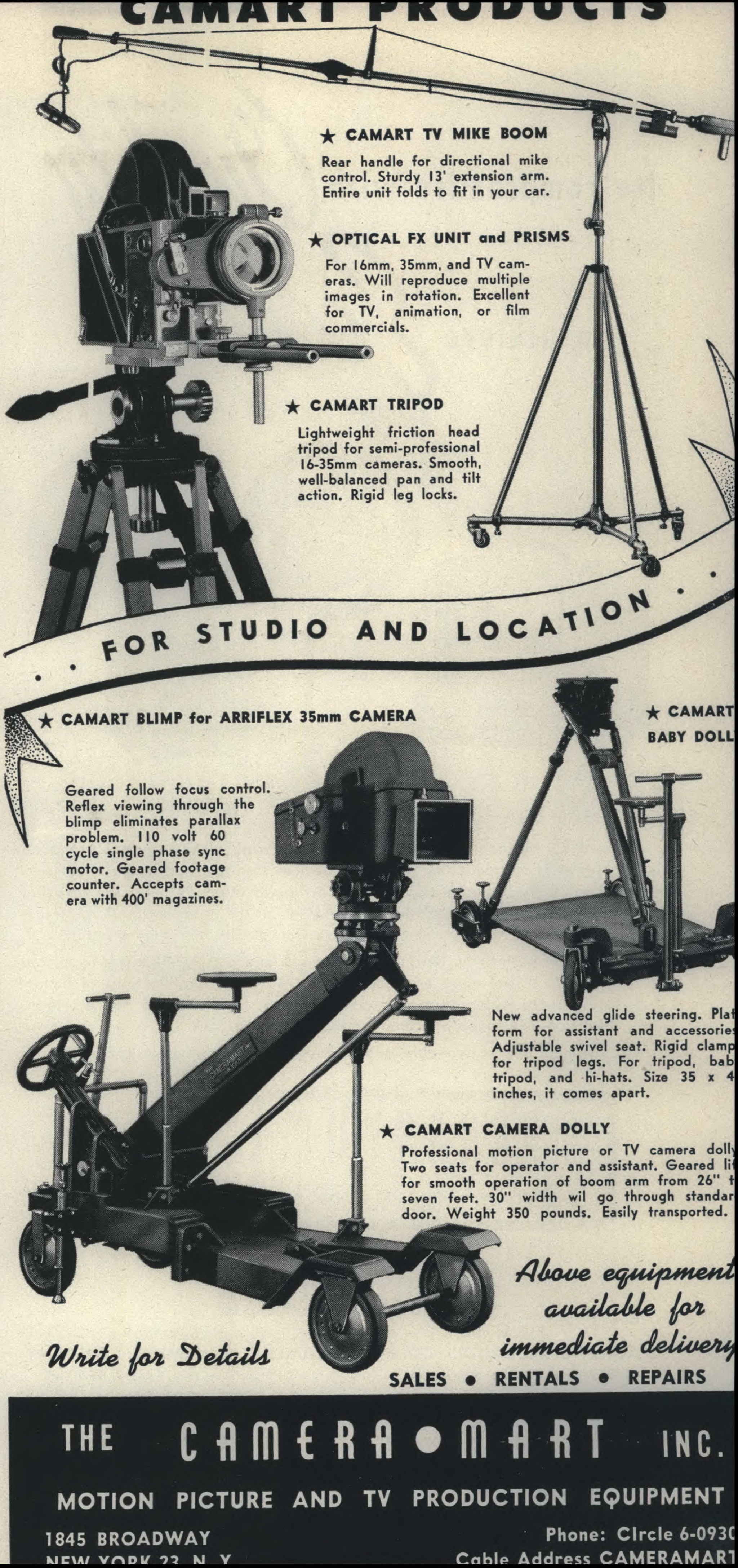
Where closeups are necessary, Bolex makes a stereo closeup attachment that gives the correct stereo effect at close distances, and at the same time it also automatically assures sharp focus. Shooting with the Bolex stereo closeup attachment makes it necessary to consider one additional point, that of stereoscopic depth of field—which need not concern us when using the basic stereo unit only.

To explain the need for this, let us consider the functioning of normal vision. In regular viewing, we can only see an object either at 10 inches or 10 feet properly, but not both together. The same holds true in stereo shooting. The subjects must be within a certain range of distance called stereoscopic depth of field. Using the Bolex closeup lens No. 1, the stereoscopic depth of field is from 40 inches to 5 feet; therefore, nothing should be farther away. Using closeup lens No. 2, the corresponding distances are 24 inches to 30 inches. Thus, anything in the scene beyond the maximum distance will prove distracting and should therefore be obscured or blocked off from view. This can be done with a suitable backdrop — piece of cloth or cardboard. There is one exception to this rule; that is when the background is plain, and does not contain any pattern, reflection, shadow or different colors (as for example, a plain sky). Then its distance from the camera is of no importanace.

The Bolex closeup stereo lenses are most valuable for making stereo titles. These, incidentally, should be short, easily readable, and definitely three-dimensional. The best distance for titles is right in the stereo window, which, according to the figures previously given, would have to be set up at either 40 inches or 24 inches in front of the camera. To give the titles depth, three-dimensional letters such as Mittens should be used. Hand lettered or printed title cards will not make satisfactory 3-D titles.

Guided by the information given here, almost anyone can make thrilling 16mm three-dimensional movies, using Bolex stereo equipment. For those who would like a little more technical data on the principles and function of 16mm stereo movies, we will take just a little more space to explain.

In normal vision, when an object situated at a finite distance is observed, the eyes converge upon it, and any point in the object is seen at unlike angles by the right and left eyes. When the images are projected under proper conditions, each eye sees only the image that was produced from its respective viewpoint, but the angle at which the object appears to be viewed by each eye depends on *certain technical conditions under which the scene was photographed.* Natural relief (3-D effect) is obtained if all portions of the stereo images are effectively seen at angles equal to those at which each eye, respectively, would see the object when the observer is stationed at the stated



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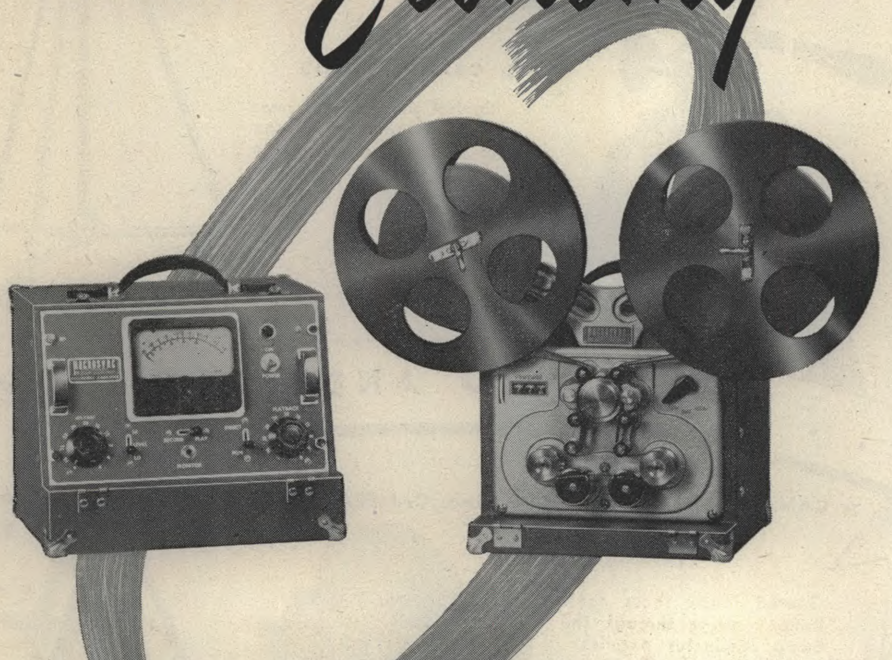

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distance from the object. The conditions that must be satisfied are determined by considering the geometry involved.

The mathematical demonstration is simple, but too long for statement here. In summary, the observer of 3-D movies has the illusion of natural relief if two conditions are satisfied:

First—the camera base (distance between the lens axes) must be equal to the interocular distance (distance between centers of the average pair of human eyes); this has been established as being between 63mm and 67mm. Professional studios have established it as 64mm, or approximately 2¼ inches. Bolex stereo lenses have the same interocular distance — approximately 64mm (Fig. 3).

Second—the observer must be seated at a point on the axis of projection and at a distance from the projection screen as illustrated in Fig. 4:

$$D = s_p f_c / f_p$$

where D is the distance of the observer from the screen, s_p is the distance of the projection lens from the screen, f_c is the focal length of the camera lenses, and f_p is the focal length of the projection lenses.

It is evident that the second condition cannot be satisfied strictly for any observer, because he would be in the projection beam. To obtain the minimum possible distortion, therefore, the observer should be as close as possible to the projection axis. If a picture is being exhibited to a group, evidently some must be closer or farther from the optimum distance from the screen; to an observer nearer the screen, the picture appears flattened, and to an observer farther from the screen, the depth of objects is exaggerated. The focal lengths of the camera lenses and the projector lenses should be so chosen by the designers of stereo equipment that the greatest possible number of observers can be placed near the optimum position; this position should not be too close to the screen.

All this has been explained in considerable detail by Eugene Millet, of the Paillard organization, which manufacturers Bolex equipment, in his article which appeared in Vol. 3, No. 1 of the *Bolex Reporter*.

Sixteen millemeter stereo movies are still too new to have developed the techniques that undoubtedly must evolve. Once again the amateur is first in a new field. He can pack the next few years with the thrills of seeking new worlds to conquer with his Bolex stereo movies.

Revere Camera Company has acquired Wollensak Optical Company of Rochester, N. Y., according to Ted Briskin, president of Revere.

THE BRIDGAMATIC

(Continued from page 271)

strips (or any particular section of the work going through) may easily be removed at any time, in any stage of processing. This is done by simply grasping both ends of the film to be removed, making a quick cut and stapling the loose ends (Fig. 2).

One master switch controls the entire assembly. Thus one cannot run the machine without the heater and blower in the drybox or the refrigeration system also being in operation. This prevents film from coming out of the machine wet.

Heliarc-welded 18-8 stainless-steel insert tanks are regularly supplied together with stainless-steel film guides or grids and simplified lifts at the bottom of each tank. This keeps the film on the lower banks of rollers when lifted for threading or cleaning the phenolic bearings. All parts in contact with solutions are of stainless steel or other inert materials (Fig. 5).

This equipment requires a minimum of plumbing. In the absence of permanent connections, a garden hose fits the two pipe fittings protruding from the wash tank. The lower pipe connects to the darkroom water supply and the upper pipe to the drain or sewer. This gives a circulating water supply in the wash tank. If a rapid water change is desired, a portable drain pump is useful in several ways. It will pump all solutions into and out of the tanks and act as a draw-off pump on the upper wash drain. A smaller pump, especially for overflow draw-off, is also available as optional equipment.

There are three speed-change pulleys mounted on the drive at the end of the standard machine: small for negative processing, intermediate for sound-track processing and large for positive film processing. A recently announced optional feature is a 10 to 1 ratio variable speed control transmission which permits an unlimited range of developing times from 2 min. to 20 min. This entirely enclosed assembly is integral with the main drive motor, and replaces the step pulleys with their three fixed speeds. A variety of formulas can, of course, be used and the raw stock suppliers can provide suitable developing and fixing mixtures. Additional formulas can also be found in the PhotoLab Index.* The average developing times are 6 to 7 min for negative, 5 min for sound track and 2 to 2¾ min for positive film. Raising solution tempera-

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*Photo Lab Index, Morgan and Lester, Publishers, 101 Park Ave., New York 17.

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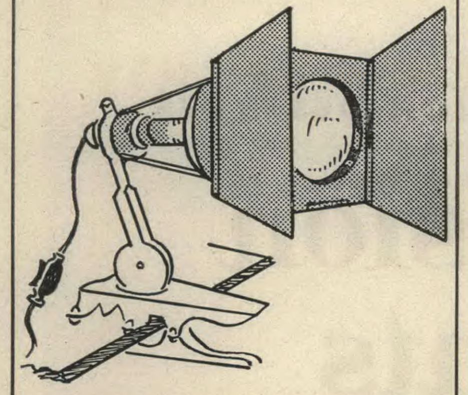

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tures to an average of 90 F decreases the developing-time cycle, and increases the machine's output considerably. An immersion heater for the water jacket with thermostatic control and an extra Calrod strip heater in the drybox can be installed as original equipment, or added later.

A special Bridgamatic high-speed Reversal 16mm machine to process at 100 fpm is also available. It is designed for ultra linear operation with but 100 ft of leader in the machine and it allows 200 ft of picture to be completely processed in 3 min. It operates at 125 F using a pressurized spray and the latest principles embodying rapid drum-type drying. The machine can be designed to exit the film head or tail first, whichever is desired. This unit is entirely automatic, including thermostats, pumps, filters and by-pass controls.

The machine will operate with only one to two gallons of developer and producing excellent results, effecting a considerable saving in chemicals on small jobs. Normally for larger runs, quantities of 2½ to 5 gals. are used. There is a replenishment formula furnished with most developers and over long periods this should be added as instructed. Ordinary hypo formulas with hardener added are used in the third or fixing tank. Air squeegees are provided for blowing the water from the film before it enters the drying cabinet. It is necessary, of course, to have a compressor of proper capacity operating the squeegees. This must be the type that puts out oil-free air, although a filter is recommended as well.

The basic processing machine is of a negative-positive design with four tanks: developer, rinse, fix and wash. Microfilm models have an added wash tank with spraybars. A length of from 200 to 400 ft of leader is required, and tank capacity varies from 2½ to 15 gal, depending on the model, whether 16mm, 16/35mm combination or 16mm reversal.

The most popular model at present is known as the Bridgamatic TV Reversal Special, a nine-tank machine measuring 8 ft long, 2 ft wide and 4 ft high, weighing 650 lb. It features a daylight loading magazine, feed-in elevator with rising indicator and buzzer alarm, take-up elevator, re-exposure lamp and two heaters in the drybox (Fig. 4). Aeration or bubble agitation with a controllable valve is provided for the bleach tank, with a spray header in the final wash. Speed is rated conservatively at 750 ft/hr. The new High Speed Rapid Reversal pan films recently introduced (such as Du Pont's 931) have increased this speed approximately 50%. The machine is made for operation under

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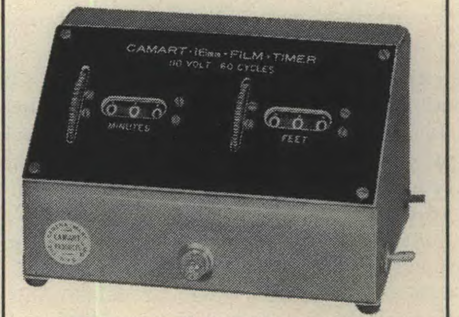

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These machines are now also custom built to a variety of speeds and sizes, from 16mm to 70mm. Two new models are being built for the new Eastman Negative-Positive Color Process or Ansco Negative-Positive Color Process. It may soon no longer be necessary for the film producer to think of color in terms of outside laboratory work and expense. Heretofore color processing machines were huge, costly and cumbersome, and certainly only an investment for the largest commercial laboratories since the cost of chemicals alone was tremendous. This small, reasonably priced color processor is expected to save many times its cost in a short time as the most expedient way of processing and controlling color quality on the spot, without the delays and accelerated production costs which go with expensive retakes.

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The advantages of this add-a-unit arrangement are considerable, for the machine's usefulness can be expanded as the needs arise. Budgets often arbitrarily limit the amount which can be spent at one time, so breaking up the equipment into smaller components proves a distinct advantage.

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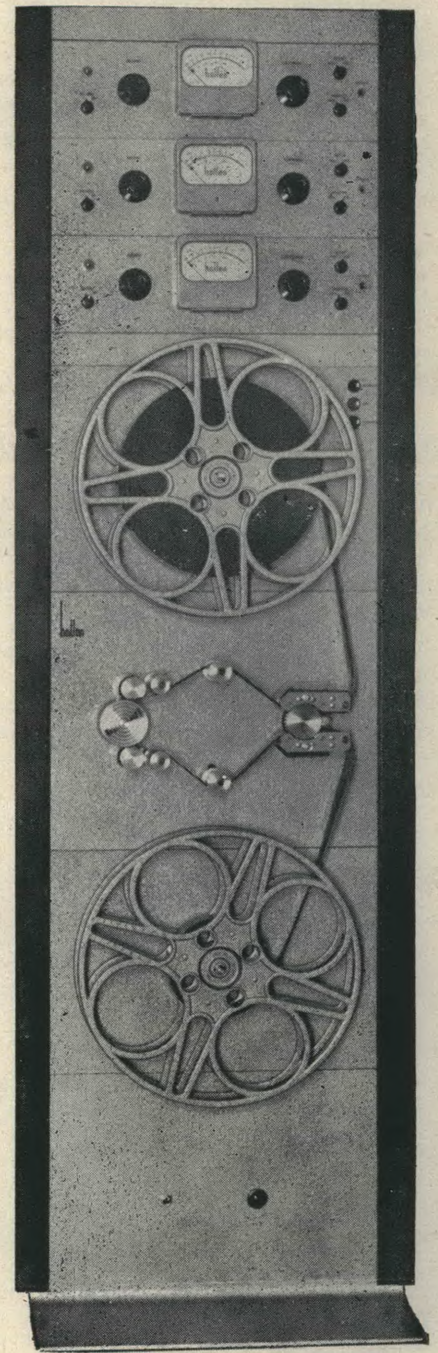

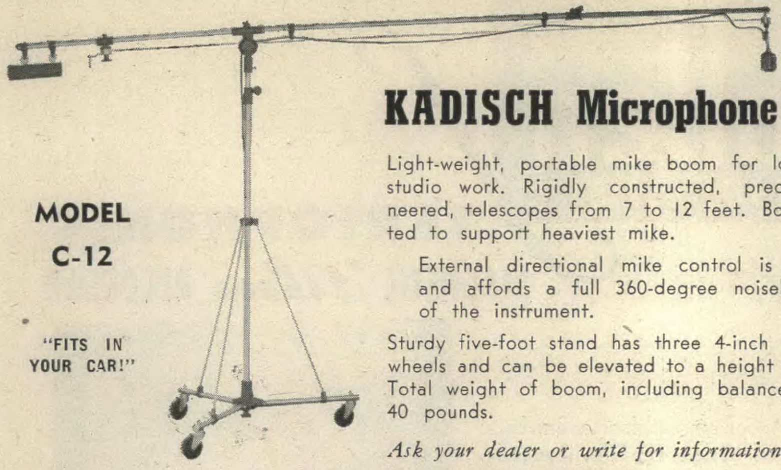

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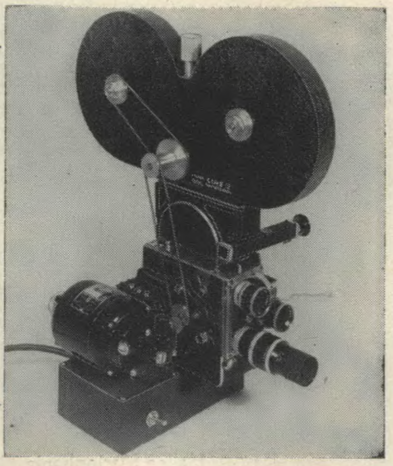

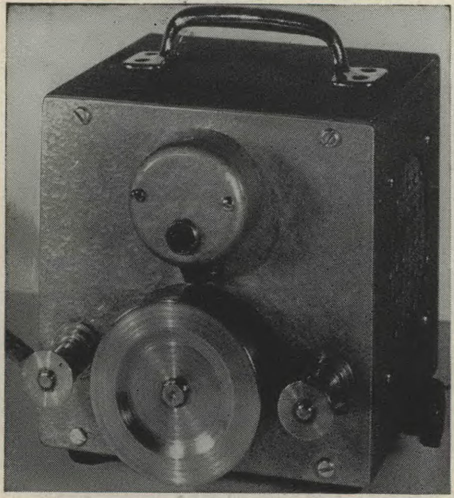

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Used Equipment Bargains — in this month's Classified Ads Page 298

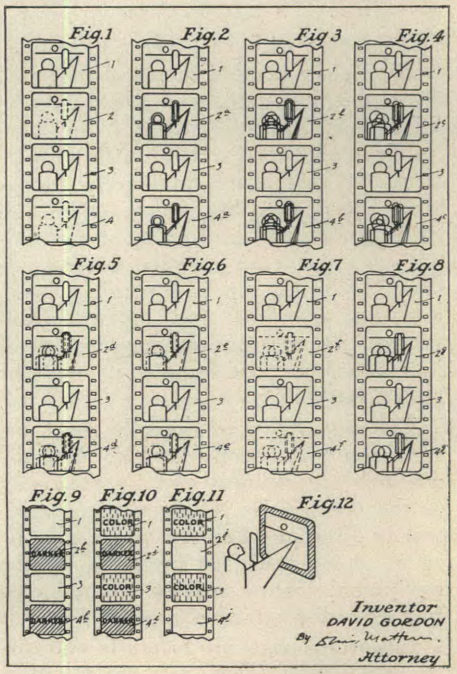
ONE CAMERA, ONE FILM

(Continued from page 269)

need for viewing spectacles. AC's editors are hearing increasingly from inventors and others with ideas — some new, some old—for stereo cameras and filming systems. One of the more persistent is Mr. Frank A. Weber of Hague, Holland, whose article describing his company's VeriVision camera appeared in the May, 1952, issue of *American Cinematographer*. Another is Mr. David Gordon of Bridgeport, Conn., who has patented a number of methods for making three-dimenson pictures, both motion and still, that require no polaroid glasses for viewing.

One of Gordon's methods is illustrated on this page. "This system," says Mr. Gordon, "relates to stereoscopic or third-dimensional motion pictures and television photography requiring no visual aids for the eyes."

His system appears to be based on the phenomenon that occurs when, at a distance one views a large photograph or other illustration having foreground figures sharply defined and which stand out in relief as compared to the out-of-focus or blurred background, ". . . especially when the foreground images are lighter and stronger in color than the colorless and much darker background images," Gordon states. "Even in binocular or stereo viewing," he says, "we notice the blurring or double background images which makes objects in the foreground stand out in relief."



3-D movies without spectacles

Gordon's invention proposes to provide similar 3-D effect to a film by the successive photographing and projection of pairs of pictures, of which each pair consists of one dominant and one subordinate image or frame—the latter containing an image which, when viewed in rapid succession in relation to the other, provides a halo image with respect to the foreground objects of the picture.

Another Connecticut inventor last month announced he had developed a new 3-D method that required no viewing spectacles. He is Albert Pickus, owner of a motion picture theatre in Stratford. The patented system, which bears the tradename Amp-O-Vision, reportedly may be used for all conventional films. More specific details were not being released until the system is put on the market next month.

In Hollywood, Mr. Friend Baker, who contributed the engineering for the Natural Vision 3-D system, which was used in filming the industry's first stereo film, "Bwana Devil," has obtained patents on still another system of 3-D photography and projection. The camera, using a single-lens system with a beam-splitting device, puts both images on a single frame of film on a single negative. In projection, all that is necessary is to change size of the aperture and mount an image-erecting device in front of the lens. The projected picture is rectangular in format with a slight wide-screen aspect ratio. The system, said to be similar to Leslie Dudley's described at the beginning of this article, was demonstrated by Baker before members of the American Socieey of Cinematographers at their clubhouse in Hollywood last month.

In the meantime, most Hollywood studios are proceeding cautiously with three-dimension films, shooting them via twin-camera, dual-film systems, and only when the story could definitely be enhanced by 3-D presentation.

THE HALLEN RECORDER

(Continued from page 274)

crophone mixing channels with two preamplification stages before the mixer are extremely high gain inputs, providing sufficient gain to obtain ample recording level from any microphone, even on long shots. A selection of high-output microphones is not required. Need for a separate mixer or preamplifier is eliminated. In addition to the two microphone channels, a high-level input is provided which may be used for loops, pre-recorded tracks, recorded music, or effects, and it will furnish maximum recording level from an input level of —20 to ±10 dbm. The volume indicator or meter has been in-

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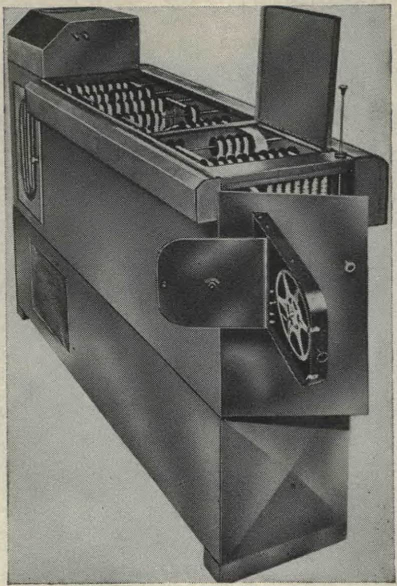

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Monitoring facilities include the speaker, mentioned above, as well as a headphone jack. Monitoring may be switched, while recording, to either the signal being recorded, or the material on the film, immediately after it has been recorded. This "simultaneous playback" feature of the Hallen 25-B is most valuable from a time saving standpoint. By making periodic checks, the mixer operator determines instantly the quality of his "take."

The record and playback amplifier system is designed around only two tube types, which are readily available at any radio store or parts house. The electronic section is so arranged that it may be powered by batteries simply by plugging in the special cable furnished for this purpose. This permits the use of battery for filament supply, and vibrator pack or dynamotor for plate supply. The whole system draws less than 200 watts, so a small portable field supply may be used for power. The units are furnished with combination motor drive system, "sync," and appropriate type of interlock.

As a safeguard against any mechanical flutter or variation in film speed, the Hallen 25-B incorporates the Academy Award winning "C. C. Davis Flutter Suppressor" in conjunction with a tight-loop system. The record and playback heads are placed inside of, and tangent to, the flywheel-loaded sound drum. The heads are at the exact point of greatest film stability, the same point at which the film contacts the flywheel. No gates or pads are used. Flutter on the Hallen has been reduced to the vanishing point, and will remain within Academy standards even under adverse field conditions.

Contributing almost equally with the Davis filter to the stability of the Hallen is the patented sprocket employed. For the first time since the beginning of motion pictures, a sprocket has been developed which gives pull over the entire surface of the film stock. So carefully was this designed that its use alone, without the Davis filter, reduced the flutter of the early Hallens.

New and revolutionary tooth form on the sprocket has eliminated "ticking" to such an extent that single-perforated film stock has been run in excess of 500 times with no distortion of the perforations or tearing whatever. It also makes possible a tighter loop used in the film circuit, and the motion comes up to speed much faster. The full surface smooth pull also has the ability to play stock with defective perforation.

Audible operative noise of the Hallen is sufficiently low that on-the-set use without a blimp is common practice.

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No provision for film erasing has been incorporated into the 25-B, as tests have shown that bulk erasers, such as now used by most film studios and processors, are up to 6 db more efficient than the erase circuits employed in recorders.

Although the Hallen 25-B represents the finest in recording techniques known today, the system is readily adaptable to changes in standards or the advancement of the Art. Compensation may be easily made should new and better film stocks become available. Convenient screwdriver adjustments are provided for bias, noise balance, recording curve, meter calibration and playback amplifier output level. As the Art progresses, frequency responses will be widened, so the amplifiers are designed to be essentially flat, 20 to 20,000 cps.

Available for 16mm, 17½mm and combination 17½ and 35mm, the Hallen 25-B fills an increasing need in the motion picture industry. The Hallen Corporation has kept pace with the development of stereophonic sound for motion pictures, too, and now offers its Model 325 studio recorder, which brings to the 3-D film producer many of the same Hallen advantages found in the Model 25-B. Developed simultaneously as companion equipment is the Hallen stereophonic playback equipment for theatres. END

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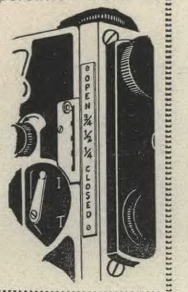

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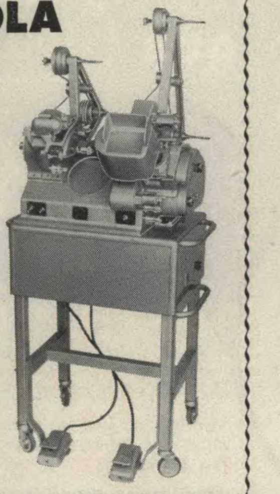

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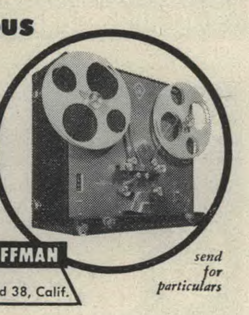

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16mm Projection For 35mm Theatres

The Debrie organization in France has developed a unique attachment which now makes it possible to exhibit 16mm sound or silent films in a theater interchangeably with its 35mm programs, using the high-intensity illumination and driving mechanism of the regular 35mm projectors, reports the British Kinematograph Weekly. It opens up a new outlet for the exhibition of 16mm films, and is certain to give impetus to the production and screening of local homemade newsreels.

The 16mm attachment is the development of Establissments André Debrie of Paris, and so far has only reached the prototype stage. It is designed to be mounted in front of a 35mm theatre projector in such a way that it can be demounted quickly for threading of film or whenever the projector is to be used for screening 35mm films.

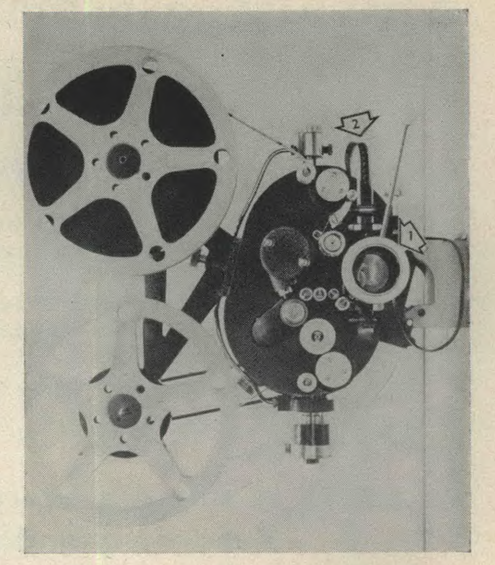
The attachment has to be threaded when demounted from the projector, and for this operation a second mounting is provided in the booth at some convenient place, such as a wall or workbench. This is a quick-detachable bracket which holds the 16mm attachment upright, as when before the projector.

The attachment is essentially a complete 16mm projector, except for lamp and driving motor. As may be seen from the illustration, the device is made more compact by the arrangement of the reels, which are positioned at an angle of 90° of the front-on conventional position of normal 16mm projectors. This permits installation of the attachment on projectors having lens close to the front wall and ports of the projection booth.

The pattern of film travel is unique in that the film passes under the takeoff sprocket and forms a twisted loop before it enters the gate; from the gate, it passes over smoothing rollers and around the sound head, thence to the takeup sprocket.

To change from 35mm projection to 16mm, the first step is to remove the 35mm projector lens. In its place is installed a special condenser lens. The 16mm attachment is then placed upon its mounting. It can be driven either from the 35mm projector motor or from a separate motor. A special pre-amplifier, which is part of the unit, is then plugged into the main amplifier of the theatre sound system.

The 16mm attachment is intended for operation at arc currents of up to 60 amps. To avoid scorching the film, a heat-absorbing filter is embodied in the unit; this is cooled by the shutter, the blades of which form a fan.



REELS are mounted at right angles to line of projection. Film forms twisted loop (arrow 2) before entering gate. Projection lens is shown at (1).

The quality of the picture and sound rendered by the attachment is said to be equal that of good 35mm projection. Reportedly, Debrie will introduce a magnetic sound head on future models, making them even more ideal for screening local newsreels, promotional films and even 16mm home movies. It isn't hard to visualize what an attachment of this kind will mean to the future of amateur film competitions, making it possible to screen 16mm films in large auditoriums and theatres and permitting larger audiences to see the many fine films that annually are produced by amateurs and amateur groups.

American Cinematographer has requested the manufacturer to inform it promptly as soon as the attachment is available for sale in the United States, and announcement of its availability will appear in these pages at that time.

STUDIO TECHNIQUE IN 16MM PRODUCTION

(Continued from page 265)

as possible. The action of the principals had to be staged so carefully that the crowd would not suspect there were actors in their midst. The cameras could not be effectively hidden — but they had to be placed where they would not obstruct the view of the audience. The activities of the large technical crew had to be so minutely pre-planned and so precisely co-ordinated that they would not detract from the sanctity of the service. In short, it would be difficult enough, for technical reasons, to shoot the sequences at all—but to do so without disturbing the natural order of things presented an almost insurmountable challenge.

The filming of the sermon itself was fraught with certain taboos that created serious mechanical problems. Ordinarily a sermon like this would be staged especially for the camera. It would be pre-edited to proper length for inclusion in the film. Clapsticks would be used to insure synchronization. The sermon would be repeated as many times as necessary to get a perfect "take" and provide a variety of camera angles.

In "Venture Into Faith," however, this simple approach could not be used. Clapsticks would have interfered with the mood of the service. Moreover, the sermon could not be interrupted for an extra take or camera angle. Even though only 10 minutes of sermon were called for in the script, the full 30 minutes had to be filmed *without interruption.*

Getting around the clapsticks taboo meant that, while the master sound track would be recorded on 16mm magnetic tape, it would be necessary to use *single system sound cameras* that would provide *cue* tracks to act as a guide for the editor to use in matching picture with the master tape track.

The choice of camera equipment boiled down to the Auricon because of the single system factor. But the capacity of the Auricon Pro model is only 200 ft. (about 5½ minutes of running time)—and there was 30 minutes of sermon to be filmed continuously. Four Auricons were ordered and set up in two banks of two each. One camera in each bank was composed on a *full shot* of the speaker. The other camera carried a longer lens set on a *close shot.* By a carefully arranged system of signals, as one bank of cameras neared the end of its 200 ft. capacity, the second bank was cued to cut in. Meanwhile, the first bank of cameras ran out of film and was reloaded. The system worked without a hitch on the first take—which was fortunate, since there could not have been a second take.

To film the crowd scenes to intercut with the sermon, all the lights which had been set up to illuminate the platform area had to be shifted around and aimed at the audience, but they had to so beamed as not to glare into the eyes of the spectators and cause discomfort. Also, the lights had to be balanced to illuminate the entire audience of 15,000 people, since panoramic shots took in the whole crowd. The lighting shiftover was ac-

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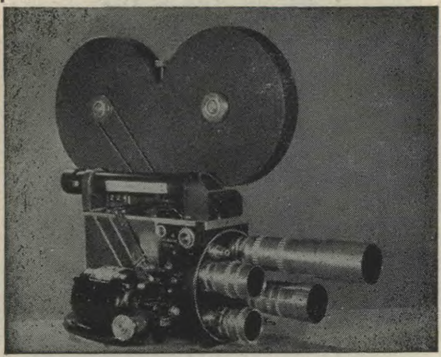

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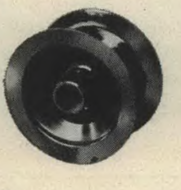

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complished in one busy morning through the diligent efforts of the electrical crew, and filming of the crowd was able to proceed that same night.

The filming of several dramatic dialogue sequences in the tent also presented serious problems. The biggest dilemma was caused by the fact that the tent had been erected only a scant 20 yards from a main highway, over which giant diesel trucks roared continuously, changing gears with a great clashing and banging. This made sound recording a torturous process. After a full day of stop-and-go recording, one major dialogue sequence was finally "in the can." However, there was scheduled for shooting another major sequence which depended largely upon a quiet atmosphere for its dramatic effect. In view of the sound problems, it was decided to abandon this touch-and-go recording situation and recreate the sequence in the studio. So, back in Hollywood, a segment of the large tent was duplicated in the studio, and filming of the intimate sequence progressed amid peace and tranquility. It is a tribute to the lighting and camera technicians that in the final print even members of Rev. Roberts' own organization could not tell the studio sequences apart from the establishing scenes filmed in Birmingham.

For certain dramatic sequences, a segment of the actual audience was recruited to appear as background for the action of the principal players. Director Herb Lightman managed to get from them performances of unstudied naturalness which, coupled with the sincere acting of the lead players, resulted in an atmosphere of complete and almost documentary realism. Despite the many technical handicaps, the crew wound up its location shooting a day and a half ahead of schedule and went winging back to Hollywood to complete shooting of the studio sequences.

After editing, scoring and dubbing, "Venture Into Faith" was previewed for members of the film industry at the Samuel Goldwyn Studios, where production was completed. It had its world premiere before an enthusiastic audience of 17,000 people in Portland, Oregon. The film is completely underscored with an effective musical background, and reflects top-notch production finish in every phase. A Spanish-language version of the picture is now being prepared for release in Latin-American and European countries.

Great credit is due the fine technical crew that met the challenge and made the shooting of this intricate film possible. Special praise goes to director of photography Fred E. West, Jr. for an outstanding job of color lensing; to Joe Carpenter, chief gaffer on the studio sequences, and to supervising film editor Carl Pingitore for a superior job of cutting. From the broader viewpoint, "Venture Into Faith" proves that quality in film production is the inevitable result of top technical know-how combined with precise pre-planning.

STUDENT MOVIE MAKERS

(Continued from page 276)

As I have said, we settled on ten members. This number was decided upon as a maximum if each person was to take an active part, and as a minimum if the cost for each member was to be kept within reason. Our teacher originally agreed to work with us one day a week, either Saturday or Sunday, for four hours, but we usually lose track of the time and work longer. We start at nine or ten in the morning and very seldom stop before five or six in the evening. In addition to that we meet one night a week, usually on Thursday, so that we can see the footage we shot on the previous weekend and discuss what we might have done to improve it. We discuss the script we intend to shoot the following weekend. This helps us develop and clarify the concept of the character or situation to be portrayed. We discuss the motivation behind the action in order to be sure of the validity of the scenes we shoot. When that is done, we take time out for a cup of coffee. Even while having coffee, we discuss professional films and film makers. Out of these talks come many interesting ideas which we try to put into practice in our own work.

Among us, we own four 16mm cameras, six tripods, a dozen clamp-on lights and light stands. Despite our limited number of lights, we manage to achieve creditable results when shooting interiors. Since we cannot afford large, professional lights, we are forced to apply techniques which create the illusion of large sets and elaborate equipment. We work only with the type of material we would have available, or could afford, if we were to go out and shoot a picture on our own. A weekly assessment pays for film and other equipment, which is made avail-

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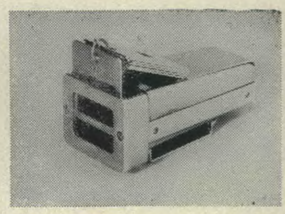

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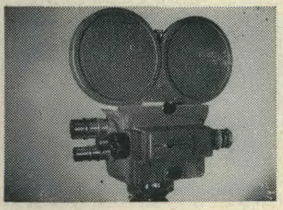

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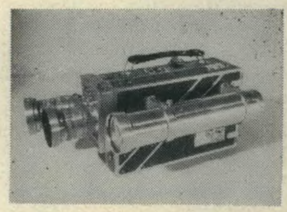

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able to any member who requires it for a personal project.

At the first meeting, each member brought along a few hundred feet of film he had shot, so that Peter Glushanok could get some idea of the type of motion pictures each of us was interested in making. In this way, he could be sure to help us develop along those lines, rather than impose an arbitrary pattern which would hamper our own creativeness. On succeeding weekends, the group worked on scripts written by the different members. Peter showed us how to put across on film the feeling, emotion, or situation that we wanted to interpret, but were not able to because of our inexperience with lighting, camera composition, and direction.

We tried to pick situations that would present a different problem each time. One Sunday we were down at the Brooklyn Bridge by seven in the morning; the following week it was a late afternoon session in the park. We worked indoors, using a combination of sunlight and artificial light, and, another Sunday, we shot a comedy lit in high key. At each of these sessions, the group members were assigned to various jobs by the member

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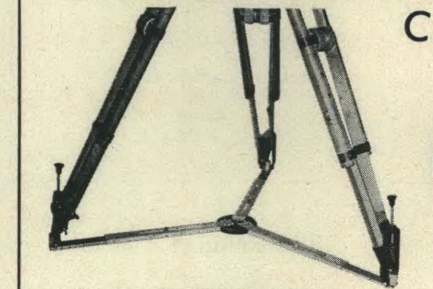

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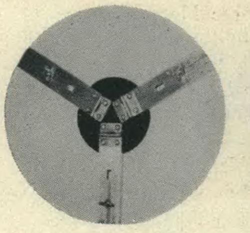

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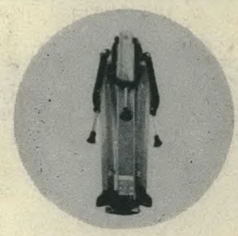

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Current Assignments of A.S.C. Members

Major film productions on which members of the American Society of Cinematographers were engaged as directors of photography during the past month.

Allied Artists

- Harry Neumann, "The Maze," (3-D) with Richard Carlson and Veronica Hurst. Wm. Cameron Menzies, director.
- Ernest Miller, Vigilante Terror," with Wild Bill Elliott, Mary Ellen Kay, Myron Healey. Lewis Collins, director.
- Ellis Carter, "The Royal African Rifles," (Color) with Veronica Hurst, Michael Tate, Robert Osterlow, John Warburton. Leslie Selander, director.
- William Sickner, "Northern Patrol," (Lindsley Parsons Prod.) with Kirby Grant, Marion Carr, Claudia Drake and Gloria Talbot. Rex Bailey, director.
- Harry Neumann, "Clipped Wings," with Leo Gorcey, Huntz Hall, The Bowery Boys, Anne Kimbell, Jean Dean, and Renie Riano. Edward Bernds, director.

Columbia

- Burnett Guffey, "From Here To Eternity," with Burt Lancaster, Montgomery Clift, Deborah Kerr, Frank Sinatra, Donna Reed, Ernest Borgnine, Barbara Morrison, Philip Ober, and Mickey Shaughnessyy. Fred Zinnemann, director.
- Charles (Buddy) Lawton, "Miss Sadie Thompson," (Beckwith Corp.) (3-D Technicolor) with Rita Hayworth, Jose Ferrer, Aldo Ray, Rudy Bond, Henry Slate, Peter Chong and Charles Buchinski. Curtis Bernhardt, director.
- Lester White, "I Ride Alone," (3-D Technicolor) with Randolph Scott, Claire Trevor, Joan Weldon, George Macready, Lee Marvin, Roscoe Ates, Alfonso Bedoya and Ernest Borgnine. William Castle, director.
- Frank Planer, "Scalpel," with Charlton Heston, Lisabeth Scott, and Dianne Foster. Irving Rapper, director.
- Henry Freulich, "El Alamein," (No cast announced); Fred F. Sears, director.
- Lester White, "Gun Fury," (3-4, Technicolor) with Rock Hudson, Jed Carey, Donna Reed, Roberta Haynes, Lee Marvin. Raoul Walsh, director.

Metro-Goldwyn-Mayer

- Robert Surtees, "Fort Bravo," with William Holden, Eleanor Parker, Polly Bergen, John Forsyth, and Richard Anderson. John Sturges, director.
- Paul Vogel, "Half A Hero," with Red Skelton, Jean Hagen and Polly Bergen. Don Weis, director.
- Robert Planck, "Torch Song," (Technicolor) with Joan Crawford, Michael Wilding, Gig Young, Dorothy Patrick, Dave O'Brien. Charles Walters, director.
- Charles Rosher, "Kiss Me Kate," (3-D, Wide-Screen, AnscoColor) with Kathryn Grayson, Howard Keel, Ann Miller, Bobby Van, Bob Fosse, Tommy Ralls, Keenan Wynn, and James Whitmore. George Sidney, director.

AMERICAN SOCIETY OF CINEMATOGRAPHERS

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Paramount

- Loyal Griggs, "Elephant Walk," (Technicolor) with Elizabeth Taylor, Dana Andrews, Abraham Sofaer, Peter Finch, Mylee Haulani, and Noel Drayton. William Dieterle, director.
- Arthur Arling, "Red Garters," (Widescreen, Technicolor) with Rosemary Clooney, Don Taylor, Gene Barry, Guy Mitchell, Pat Crowley, Joanne Gilbert, and Buddy Ebsen. Mitchell Leisen, director.
- Ray Rennahan, "Flight To Tangier," (3-D, Wide-screen, Technicolor), with Joan Fontaine, Jack Palance, Corinne Calvet, Robert Douglas, Jeff Morrow, Richard Shannon. Charles M. Warren, director.
- Lionel Lindon, "Lost Treasure Of The Amazon," (3-D, Wide-screen, Technicolor), with Fernando Lamas, Rhonda Fleming, and Brian Keith. Edward Ludwig, director.
- Daniel Fapp, "Knock On Wood," (Widescreen, Technicolor) with Danny Kaye, Mai Zetterling, Torin Thatcher, David Burns, Leon Askin, and Abner Biberman. Producer-directors, Norman Panama and Melvin Frank.

R.K.O.-Radio

- Nick Musuraca, "Arizona Outpost," (3-D Eastman Color) with Virginia Mayo, Dale Robertson, Stephen McNally, Arthur Hunnicutt, Rober Keith, Jay C. Flippen, Whit Bissell, William Phillips and Morris Ankrim. Alfred Werker, director.
- William Snyder, "Son Of Sinbad," (3-D, Color) with Dale Robertson, Lili St. Cyr, and Vincent Price. Ted Tetzlaff, director.
- Harry Wild, "The French Line," (Edmund Grainger Prod., Technicolor) with Jane Russell, Arthur Hunnicutt, Craig Stevens, Steve Flagg, and Laura Elliott. Lloyd Bacon, director.

20th Century-Fox

- Edward Cronjager, "Twelve-Mile Reef," (CinemaScope, Technicolor) with Terry Moore, Robert Wagner, Gilbert Roland, J. Carrol Naish, Harry Carey, Jr., Jacques Aubuchon, Angela Clarke and Peter Graves. Robert D. Webb, director.
- Joseph LaShelle, "Be Prepared," with Clifton Webb, George Winslow, and Frances Dee. Henry Levin, director.
- Milton Krasner, "The Story of Demetrius," (Cinemascope, Technicolor) with Victor Mature, Susan Hayward, Michael Rennie, Ann Bancroft, Jay Robinson, Barry Jones, and William Marshall. Delmar Daves, director.

Universal-International

- Carl Guthrie, "Ma and Pa Kettle Hit The Road Home," with Marjorie Main, Percy Kilbride, Alice Kelley, Alan Mowbray, Brett Halsey, Emory Parnell, Oliver Blake and Stan Ross. Charles Lamont, director.
- Cliff Stine, "Wings of The Hawk," with Van Heflin, Julia Adams, Abbe Lane, George Dolenz, Antonio oreno, Rudolfo Acosta. Budd Boetticher, director.

Independent

- Lee Garmes, "Outlaw Territory," (Broder Prod., Stereo-Cine, Pathe Color) with MacDonald Carey, Joan Dru, and John Ireland. John Ireland and Lee Garmes, directors.
- Stanley Cortez, "Shark River," (John Rawlins Prods., Wide-screen Eastman Color) with Steve Cochran, Carole Mathews, and Warren Stevens. John Rawlins, director.
- Gilbert Warrenton, "Sins Of Jezebel," (R. L. Lippert, Jr., Prod., Wide-Screen, Ansco Color), with Paulette Goddard, George Nader, John Hoyt, Eduard Franz, John Shelton, Margia Dean, Joe Besser, Carmen D'Antonio. Reginald Le Borg, director.
- Lee Garmes, "Hannah Lee," (Broder Prod., Stereo-Cine 3-D, Pathe Color) with MacDonald Carey, Joanne Dru, and John Ireland. John Ireland and Lee Garmes, directors.
- Joseph Biroc, "Rage Of The Jungle," (Alpine Prods.) with Glenn Ford, Ann Sheridan, Zachary Scott, Jack Elam, and Rodolfo Acosta. Jacques Tourneur, director.

whose project was being worked on. He was the director, and would select someone to act as his cameraman, decide on camera angles and work out the lighting, etc. Other members would check the amount of current available, set up the lights, slate scenes, keep a script record of all that happened, and perform numerous other jobs. So that we would become familiar with all phases of production, each one of us handled a different job each week.

At a typical shooting session we get out the equipment and set it up, give everyone a job and get ready to start shooting. The director selects the camera angle. At this point our teacher checks the finder and asks why this particular angle has been selected. Each of us turn takes a look through the finder so that we can enter or evaluate the discussion. He might want to know, for example, if this low angle, making the actor appear taller and crowding him to the top of the frame, helps in creating the desired mood or in emphasizing the character. If it does, then it is acceptable, and not because it makes an interesting angle. He will also remind us to consider the action to follow in selecting the camera angle. We might have differing ideas about the proper angle, but the final decision is the director's. How effective his choice was will be decided when the footage is shown the following Thursday.

The angle having been decided upon, the next job is the lighting. The first light set is the key light. Fill lights are added where needed to keep the picture within a desired ratio or contrast. Mr. Glushanok watches us as we work and if he sees that we are striving for an effect but cannot attain it, he shows us how it might be achieved. While the actor is being rehearsed, the meter reading, focus and distance are checked. Now, all that is left to do is to push the button. When we get a good "take," lights are killed and we're ready to start on the next shot.

These sessions were very valuable to all of us, but, by the end of ten weeks, the group recognized some basic needs which were not being served, and decided to change the plan of work. Until this time, we had been spending only one day on each member's script, with the idea that he would finish it on his own. Thus some members of the group were becoming discouraged and losing interest, because they felt nothing was being carried through to completion. It was then decided to have a different one of us shoot a short movie each weekend, screen it, select the best takes, edit it to a final form, and then screen it for the others, so that we

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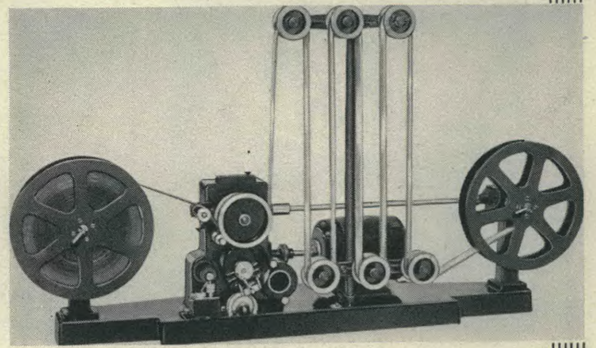

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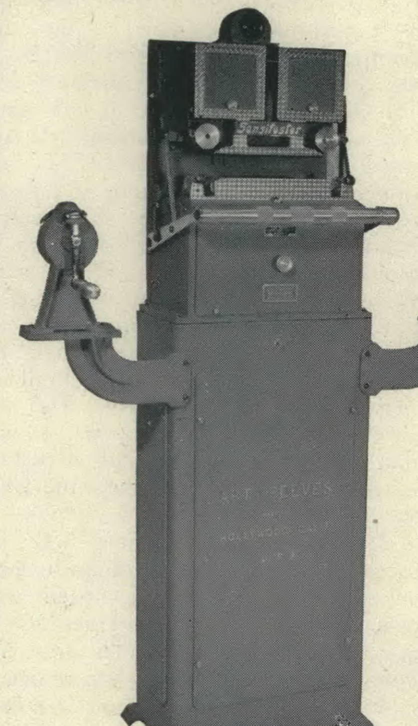

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could applaud the good and suggest changes for the bad. This is the way we are working now, and it has proved to be very effective. We try, in three or four shots, to put across the character of a person who is performing some simple activity. Each week a different type of personality is depicted, using the same actress, setting, and activity, but creating a change through lighting, camera angle, and editing.

Some have suggested that there is danger in going on as we have, because we could continue studying indefinitely and never get started on our own. Therefore, we plan to drop the Sunday sessions and get out and make our own movies. We're going to continue having the evening meetings, though, so that we can exchange ideas, show the footage we shoot, get suggestions on how to solve problems which have stumped us, and, most important, just to keep the group together.

NEW CAMERA DOLLY

(Continued from page 273)

these two mediums has proven to be a happy coincidence for engineering designers and manufacturers concerned with this type of equipment in that the same design, if carefully planned, may be used in either film making or television with only minor modifications, such as seat placement, TV cable guards, etc. The design objective in the preliminary work on the Multidolly was an item of equipment which was not only capable of providing extreme camera maneuverability but was adaptable to more than one manner of camera installation on the dolly.

In figures 1 and 2 the equipment is shown with an automatic hydraulic camera hoist which permits change of camera lens height, either up or down, during photography. The basic hydraulic circuit consists of six major components, as shown in figure 2. The hydraulic fluid is pumped by the hand pump (1) from the reservoir (2) to the pressure storage accumulator (3). The pressure is indicated on the guage (4) and the operator controls the upward and downward motion of the camera by using the valve (5) to direct the fluid into the single-acting cylinder (6) for upward motion. An alternate handle position of the same valve is used to open the fluid line so the weight of the equipment on the hoist will exhaust the cylinder for downward motion, with the fluid directed back to the reservoir. The sensitivity of the control valve is such that the start and finish of a vertical move may be held imperceptible when the picture is projected.

The steering mechanism was designed to provide the optimum in maneuverability which was consistent with practical mechanical construction. In any wheeled vehicle which must negotiate a turn, the ease with which it may be moved is affected by the floor surface, the weight, the wheel diameter, the tire material, and most important, the position of each wheel relative to the point about which the vehicle is turning. The steering mechanism permits two optional manners of steering, as diagrammed in figure 3. Number 1 shows position the wheels must be in before a shift may be made from one type of steering to another. Number 2 shows an example of the wheel positions in parallel steering, wherein all wheels remain parallel to each other and move in unison with the steering handle. The degree of rotation which the entire combination of handle and four wheels is capable of is unlimited and may go through several 360° rotations if the photographic treatment of the scene requires such a camera motion.

Number 3 shows the relative wheel positions in circular or differential steering. The line through point C extends to infinity on either side of the dolly and is the locus of an infinite number of points about which the dolly may be turned. The center about which the dolly is turning in number 3 is at R, and if all the wheels are to roll freely without any side skid they must be positioned as shown with the theoretical projection of each wheel axle passing through the center of turn.

Number 4 shows the extreme position of the wheels in circular steering, wherein the center of turn (R) has moved within the body outline of the dolly and coincides with the center point C. The requirement of accurate wheel positioning is dictated by the geometry of steering as outlined briefly above, and any compromise will contribute much in making the equipment sluggish in maneuvering.

Parallel steering, by definition, is an easy thing to accomplish mechanically, but the differential positioning of the wheels in circular steering presented a new problem in the science of differential mechanisms. The scope of this article does not permit going into the Multidolly steering mechanism in detail; however, the problem

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WESTERN ELECTRIC MOVIOLA Composite pix-sound. Rebuilt	595.00
DEPUE 35mm DOUBLEHEAD Sound & Picture Printer. Rebuilt	2,950.00
SCHUSTEK (B&H) OPTICAL 35/16 Pix Reduction Printer, rebuilt	2,995.00
WALL MOVIETONE 35mm Single System outfit, $7000 value	3,995.00
VERTICAL ANIMATION STAND, $1900 value	995.00
NEW COLLUX COLOR Temperature Meter. Reads Kelvin, foot candles. Compact 2½" face, complete with 6 filters, case	275.00
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RANGERTONE COMPLETE ¼" synch tape system—just factory checked.
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New cost $5,500.00, best offer over $3,000.00. Box **1175,** AMERICAN CINEMATOGRAPHER

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MITCHELL 35mm Standard camera, two 1000′ mags, 40,50,75, 100mm Astro lenses, sync motor, variable motor, matte box, finder, friction head tripod and baby, all cases; complete with FEARLESS blimp for sound studio operation. All equipment in excellent condition	$6,000.00
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CAMART sync motor and base plate for Arriflex 35mm camera	295.00
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B&H Standard 110 volt variable speed motor	195.00
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200 NEW, ER-6-2B Willard plastic 2 v. wetcell batteries, visual charge indicator, excellent for power supplies, Reg. Price $7.50	$ 4.40
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SPEED GRAPHIC, 3¼" x 4¼" F4.5	62.50
AMPRO Tape Recorder— Reg. $119.50, L. N.	72.50

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BASS . . . Chicago. Cinema headquarters for 43 years offers money saving buys in guaranteed used equipment. Cine Special, 4 lens turret, C mt., 1" F:1.4 Ektar, 4" F:2.5 Cooke Panchrotal, 0.7" F:2.5 Comat W.A., 6" F:4.5 Cooke, optical view finder, 2 extra 100 ft. chambers, DeLuxe Comb. Case. $2768.00 value for $1475.00; B. & H. Automaster, 1" F:1.5 Cooke, 2" F:3.5 Cooke, 4" F:4.5 Wollensak $237.50; B. & H. 70A Spider Turret 3 speed, 1" F:3.5 Cooke, 2" F:4.5 Eymax, 3" F:4.5 Telate, Comb. Case $132.50; Keystone A-7, 1" F.2.7, Case $37.50; 200 ft. chamber for Cine Special $325.00; K-8 Keystone, ½" F:2.5 $27.50; L. N. K-160 Keystone 16mm. projector, Case $99.50. Best buys . . . Best trades always.

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35MM. FILM Recorder with or without Galvanometers. 35mm. dubbers for standard or 100 mil. and 200 mil. Push-Pull. 35mm. Pre-View magazines and Projectors. BLUE SEAL SOUND DEVICES, P.O. Box 1008, New Canaan, Conn.

NEW B&H 70-H, Cooke 1" 1.4, 400 ft. magazine, 115 volt 8-64 fps motor, 70-H case. Shot 800′. $900.00. Box 416, Oklahoma City, Okla.

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MAURER 16mm. Camera, Model 05, viewfinder, 400 ft. magazine, 110 volt sync motor, 8 frame hand crank; sunshade, filter holder, case—plus extras: one inch F1.4 Ektar, 40mm. Ektar F1.6, 15mm. Ektar F2.5; three 400 ft. magazines with case; 12 volt DC governor controlled motor. Complete outfit $4,210.00. MARTIN R. HUGHSON, 493 Brantwood Rd., Buffalo 21, N. Y.

16mm. HOUSTON processing machine. Model KIA. Like New. List $5,500. Bargain at $3,300. CAMERA EQUIPMENT CO., 1600 Broadway, New York 19, N. Y.

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ALL 16-35MM production, laboratory, and editing equipment. From single items to complete studios. Will accept used equipment in trade.

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16MM. KODACHROME FOOTAGE of Bees, Bumblebees, Spiders, Snails, Sow Bugs, Toads, Grasshoppers, Lady Bugs and Daddy Long Legs. If it is good we will buy it . . . if it isn't we will return it. RAMPART EDUCATIONAL PRODUCTIONS, 2360 Huntington Drive, Duarte, California.

WANTED 65 or 70mm. sprocket hole perforator or 35mm. modifiable new or used. State condition & price & where machine may be inspected. Box **1176,** AMERICAN CINEMATOGRAPHER.

URGENTLY WANTED BACK COPIES AMERICAN CINEMATOGRAPHER: April, June, July 1947, February 1953 issues. BOX 1173, AMERICAN CINEMATOGRAPHER.

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Mitchell — Akeley — B & H — Wall — Eyemo
Cameras — Lenses — Equipment
NATIONAL CINE EQUIPMENT, INC.
209 West 48th St., New York, N.Y.

(Continued on next page)

Classified Ads

(*Continued from Preceding Page*)

CAMERA & SOUND MEN

ATTENTION PRODUCERS: This summer I will be in Portugese East and South Africa directing the photography of STRANGE HORIZONS, a full length 35mm. color feature, for Calvert Productions of London. Expect to return to New York about October 20th at which time I will again be available to shoot your pictures. Airmail will reach me at 66 Market Street, Johannesburg, South Africa until August 20th, then Foster's Agency, Piccadilly House, Piccadilly Circus, London until October 15th. HOWARD CAGLE, 14 East 64th St., New York.

EUROPEAN PRODUCTION CREW
We will have a full production crew in England and the continent during July and August. Available to take on a few additional assignments.
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CAMERAMAN will take any assignment in Cuba. Color or B&W. Direct or separate Auricon sound or Sync. Tape 16mm. equipment. MANUEL CONDE, J y 23. Vedado, HAVANA.

CAMERAMAN AVAILABLE for assignment in the PHILIPPINES and nearby territories. 16 and 35mm B&W or Color. RCA sound if needed. WILLIAM H. JANSEN, A.S.C., 651-B, Inverness, Santa Ana, Manila, P. I.

"3-D" 35MM STEREO camera and services available. SAMUEL KRAVITT, 1096 Chapel, St., New Haven, Conn.

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SOUND RECORDING at a reasonable cost. High Fidelity 16 or 35. Quality guaranteed. Complete studio and laboratory services. Color printing and lacquer coating. ESCAR MOTION PICTURE SERVICE, INC., 7315 Carnegie Avenue, Cleveland 3, Ohio. Phone ENdicott 1-2707.

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has been solved and the result is a precision assembly of mechanical components which delivers without compromise the required wheel positions for circular and parallel steering.

The wheel motion generated by this steering mechanism is transferred to the wheels themselves by roller chain and the chain tension, and alignment of each wheel is adjusted by chain sprocket idlers on each strand of chain. The position of the steering handle (Fig. 2, number 7,) for any position of the wheels is such that the necessary force to propel the dolly is applied in equal amounts at each end of the steering handle and at 90° to the alignment of the handle. The handle for making the shift in steering (Fig. 2, No. 8) is located immediately forward of the steering column and is readily accessible to the operator of the dolly. The motion necessary to accomplish the shift is a 180° rotation of the shift handle with a slight vertical motion at the midpoint of the rotation.

It is conceivable that certain film productions do not require a change of lens height any more convenient than that which may be attained with a tripod. So with an accessory support for the front leg of the tripod the most basic combination of camera equipment may take advantage of the extreme steering maneuverability of the Multidolly, using the dolly carriage only without the hoist, and the operator is provided with a large convenient working space back of the camera. A problem which is encountered not frequently but inevitably in every studio is how to get the lens lower than whatever level it may be at the time. To anticipate this an auxiliary support arm has been planned which will hold the lens to floor dimension at a minimum with the camera placed slightly forward of the front wheels, again using the dolly carriage only, without the hoist. This positioning of the camera leaves the entire bed area of the dolly clear for crew convenience.

Future plans for the Multidolly call for installation of seats for the cameraman and operator, and tests are presently being conducted in actual production to determine the most suitable type of seat and placement of same.

The designer and manufacturer of the Multidolly, in submitting it to the film industry for consideration, said, "We believe that the final measure of the worth of such equipment lies in what it does for the camera, and the ease and convenience with which it may be used."

All technical data supplied by John McCollough of Cinetel Products, Hollywood.

HOLLYWOOD BULLETIN BOARD

(Continued from page 254)

raphy of the initial series of Jack Benny TV shows, to be produced by Desilu Productions. Tannura also photographs the Burns and Allen TV shows, and will return to this chore when the company resumes production in the fall.

•

FERDINAND EICH, ASC, formerly with the Paramount studio laboratory, is now associated with Technicolor in Hollywood.

•

JOHN W. BOYLE, ASC, and **HAL MOHR, ASC,** last month were reelected to the board of governors of the Academy of Motion Picture Arts and Sciences for 1953-54.

•

WM. N. WILLIAMS, ASC, is in Zurich shooting background plates for Paramount.

•

LEON SHAMROY, ASC, three-time Academy Award-winner, and the first cinematographer to shoot a Cinemascope production in Hollywood, was married in Hollywood last month to film actress Mary Anderson.

ASPECT RATIO of the screen on which Warner Bros.' "House of Wax" was projected in its Hollywood premiere was 160 to 1, according to studio's William Mueller, and not "just slightly larger" than the normal 133 to 1, as stated here last month.

•

CHARLES G. CLARKE, ASC, is in Europe for 20th Century-Fox, directing second-unit photography for "The Valiant" in Cinemascope and color.

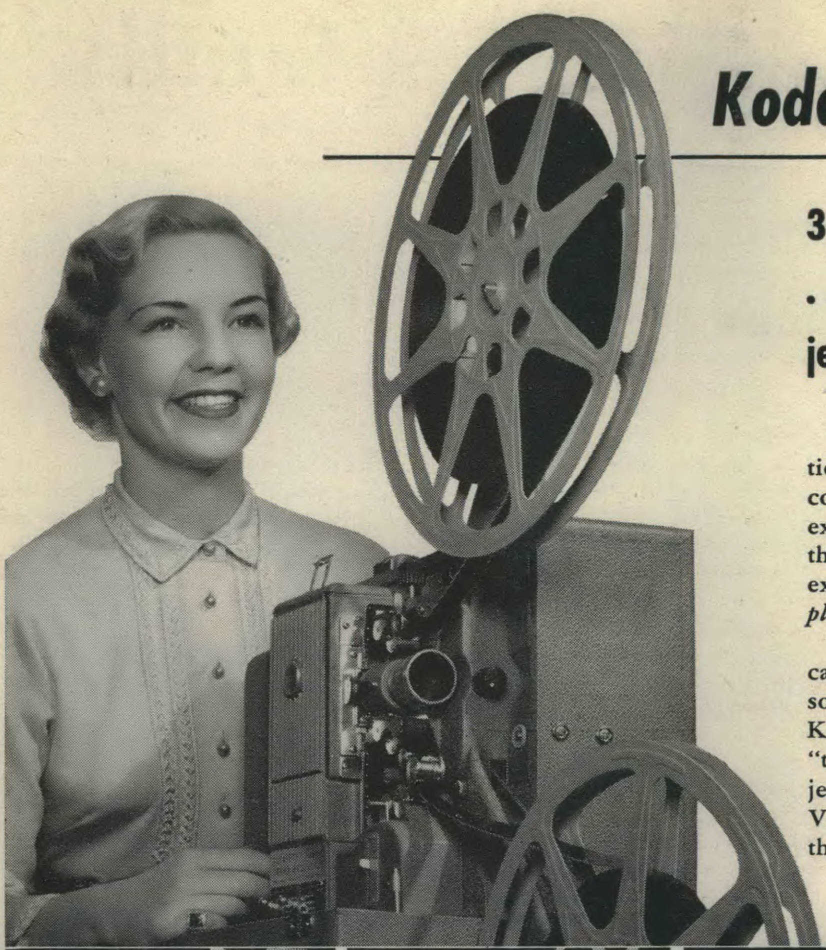
•

JACK CARDIFF, ASC, Academy Award-winning photographer, has been signed to direct the Errol Flynn starrer, "The Story of William Tell," which goes into production in Rome this month. This will mark his debut as a director.

•

JAMES WONG HOWE, ASC, made his directorial debut for producer Albert Palca last month. Production is an original screenplay based on the life of Abe Saperstein, owner-coach of the Harlem Globetrotters' basketball team. Picture was filmed in New York.

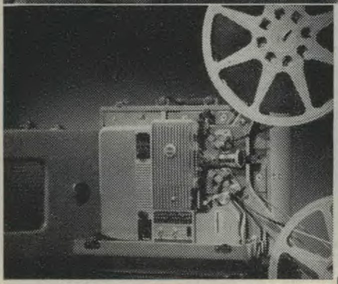
Kodak announces . . .



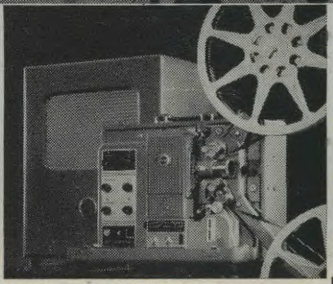
3 brilliant new Pageant models . . . and a heavy-duty silent projector for critical movie analysis

The Pageant is the projector that has revolutionized 16mm. sound projection . . . the first compact projector with the optical and tonal excellence of full-scale 16mm. equipment . . . the first to offer permanent prelubrication—an exclusive 16mm. feature that eliminates *completely* the chief causes of projector breakdowns!

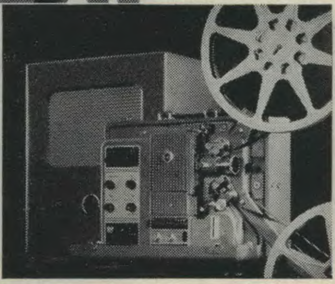
At just $400, the Pageant is still the economical top-choice projector for average 16mm. sound-and-silent projection. But now from Kodak have come four more projectors—each "tailor-made" to meet a particular 16mm. projection requirement. See your Kodak Audio-Visual Dealer about a demonstration—or use the check slip below for further information.



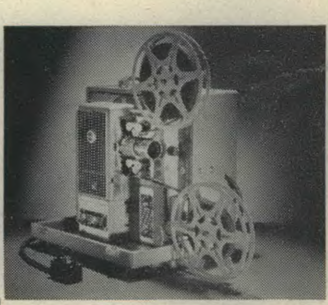
NEW Kodascope Pageant Sound Projector, Model AV-071, with Plus-40 Shutter A super-brilliant version of the standard Pageant, it incorporates an extremely efficient two-bladed shutter which provides vastly increased illumination—more than 40% greater than the sound-and-silent projector. Ideal for projection under difficult conditions . . . in hard-to-darken rooms, in halls or auditoriums . . . *wherever* extra image brilliance, long screen "throws," or unusually large picture areas are required. $400. *Sound projection only.*



NEW Kodascope Pageant Sound Projector, Model AV-151, with 15-watt amplifier Features an extremely high-fidelity amplifier, the extra capacity of the 12-inch Kodak De Luxe Speaker, and provision for the finest sound fidelity obtainable with a 16mm. portable projector. Ample power output and speaker capacity for auditorium projection . . . plus separate bass, treble, and fidelity controls for unmatched sound quality in cramped quarters as well as in spacious auditoriums. $530. *Sound-and-silent projection.*



NEW Kodascope Pageant Sound Projector, Model AV-151E, with Plus-40 Shutter and 15-watt amplifier Combines increased light output produced by Kodak's Plus-40 Shutter with the precise tone and volume features of the Model AV-151. No other portable projector gives you such brilliant screening—even on long throws—plus such excellent tonal quality at all volume levels. The Pageant, Model AV-151E, is capable of meeting *every* 16mm. requirement short of a theater-type installation. $530. *Sound projection only.*



NEW Kodascope Analyst Projector Heavy-duty silent projector designed to meet the critical requirements of 16mm. motion-picture analysis . . . ideal for such fields as time-and-motion study and sports analysis. Features a heavy-duty reversing mechanism operated from a remote-control switch on a 5-foot cord. Separate motor drives blower at constant speed, permitting *repeated, instantaneous* reversals without film or projector damage. With Daylight Projection Viewer, for desk-top movie study, $295. *Silent projection only.*

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Please send name of nearest Kodak Audio-Visual Dealer. Complete information on equipment checked: ☐ ***Standard Pageant*** ☐ ***Pageant Model AV-071*** ☐ ***Pageant Model AV-151*** ☐ ***Pageant Model AV-151E*** ☐ ***Kodascope Analyst*** ☐ ***Kodak Multi-Speaker Unit***

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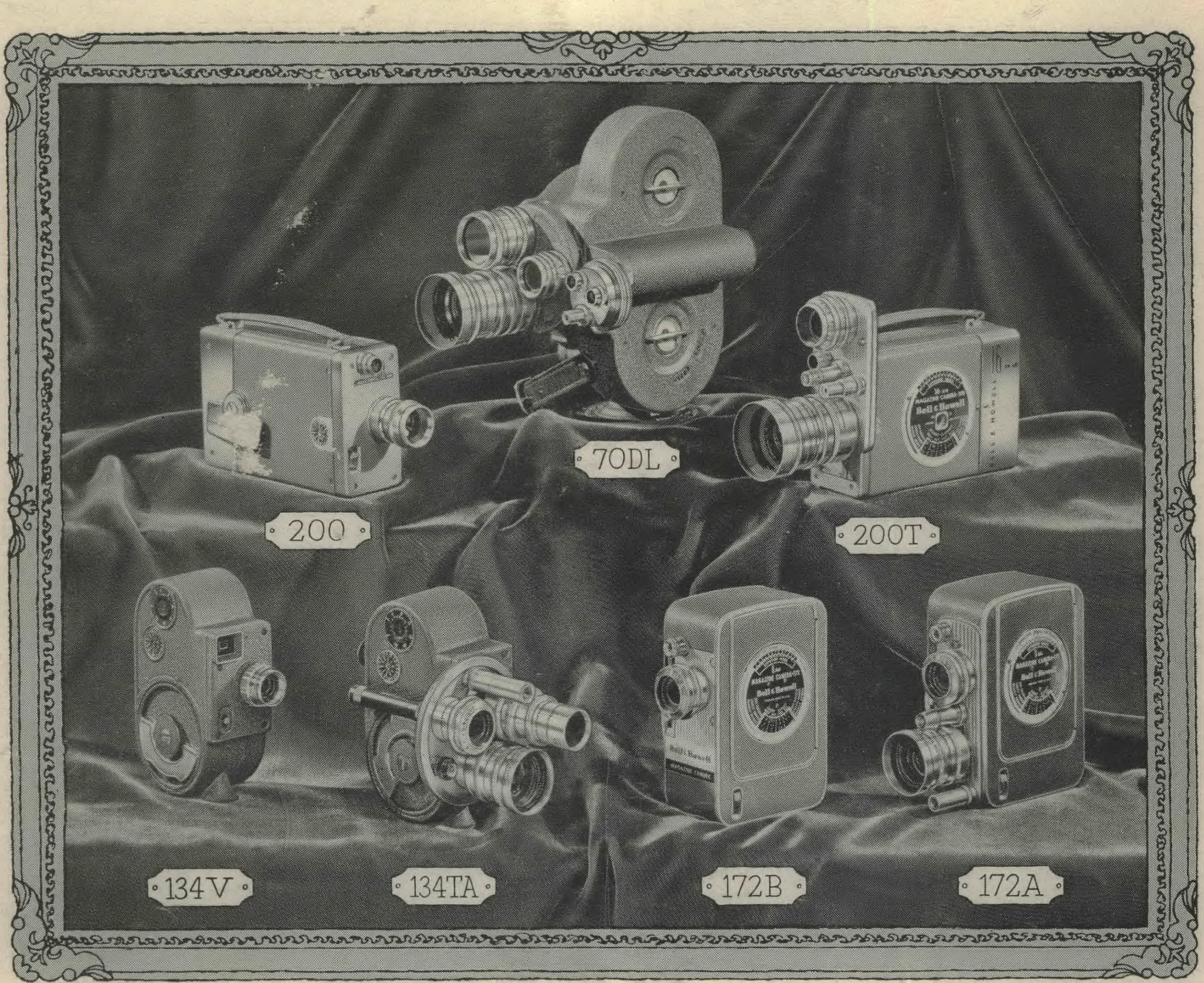

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The Cameraman's "16"—known the world over as the 70DL, this famous 16mm spool-loading movie camera is the choice of advanced amateurs and professionals. Many exclusive Bell & Howell features . . . a superb instrument for the serious movie maker. 70DL—$365.50 with 1" f/1.9 lens only.

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Low-cost "8's"—for the movie-maker on a budget, Bell & Howell cameras prove quality needn't be sacrificed for economy. Choice of spool- or magazine-loading . . . single lens or turret models. 134V—$89.95; 134TA—$129.95 with ½" f/2.5 lens only; 172B—$134.95; 172A—$164.95 with ½" f/2.5 lens only.

Bell & Howell makes it fun to make movies